

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Washington State Department of Ecology (WDOE)

AREA OF STUDY: Lower Columbia River-Longview

SAMPLING MEDIA: Surface sediment (top 2 cm)

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Andreasson 1991a

CONTACT: Jeanne Andreasson, WDOE, Olympia, WA

PHONE: (206) 407-6000

FAX: N/A

SAMPLING PERIOD: April 1990

NUMBER OF STATIONS SAMPLED: 3 stations

LOCATIONS OF STATIONS SAMPLED: The sampling locations were near the Weyerhaeuser's pulp and paper mill's waste treatment plant outfall. Samples were collected next to the 54" diffuser outfall pipe, approximately 300 ft downstream from the diffuser and approximately 4500 ft upriver (for background).

TARGET ANALYTES: Dioxin/furans; volatile and semivolatile compounds; metals (Sb, As, Be, Cd, Cr, Cu, Pb, Hg, Ni, Se, Ag, Ti, and Zn); organochlorine pesticides and PCBs. Conventional analyses included TOC and grain size.

ANALYTICAL TECHNIQUES: Dioxin/furans (EPA 8290); VOAs (EPA 8240), BNAs (EPA 8270), metals (EPA 7041, 7060, 6010, 7131, 7421, 7740, 7841), pesticides/PCBs (EPA 8080). All results, except for mercury, were reported on a dry weight basis. Mercury results were converted to dry weight basis for entry into the database using the reported percent solids content of the sediment. Total dioxin and furan concentrations were determined by the laboratory as the sum of the individual congeners that were detected.

SAMPLING EQUIPMENT USED: 0.1 m² van Veen grab sampler

SAMPLE HANDLING AND PROCESSING: Individual sample grabs were placed on ice and delivered to the laboratory.

DATA GAPS: Latitude and longitude were not provided. Latitude and longitude were estimated for entry along with the data provided in the database.

ABSTRACT

The objectives of the Weyerhaeuser, Longview Pulp and Paper Mill's Class II Inspection were to verify effluent compliance with NPDES permit (NPDES Permit No. WA-000012-4), characterize priority and non-priority pollutants in industrial in-plant waters, treatment effluent and in sediments near the 001/002 outfall, determine the removal efficiency achieved with secondary treatment of industrial streams, evaluate any toxicity in the 001/002 effluent and sediments using several bioassays and to characterize any priority pollutants in the Radakovitch landfill leachate or in the R-W Paper plant drainage into Longview Ditch #3 (Andreasson 1991). The inspection also reviewed lab procedures at the mill to determine adherence to accepted protocols and advance state-of-the-art compliance inspections by contributing to ongoing developmental efforts with centrifugation. Sediment samples were taken near the point of effluent discharge, at a point 300 ft downstream from the discharge, and at a point 4500 ft upstream from the point of discharge.

QA/QC EVALUATION - Laboratory procedures which were followed are described by Kirchmer (1988) and Huntamer and Smith (1988). Matrix spike, matrix spike duplicate, and internal standard recoveries were performed.

The laboratory data were reviewed and data qualifiers were added as appropriate. The data qualifiers used were defined as follows:

BIndicates method blank contamination.

EMPCEstimated maximum possible concentration.

JEstimated value when result in less than the specified quantitation limit.

REJRejected analytical result.

UNot detected. Value is the quantitation limit.

DATA USE AND COMPARABILITY - Users of these data should be reminded that they were collected in the vicinity of a potential source of industrial pollutants.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Andreasson, J. 1991. Class II Inspection of Weyerhaeuser, Longview Pulp and Paper Mill, April 16-18, 1990. Washington State Department of Ecology, Environmental Investigations and Laboratory Services Program, Olympia, WA.

Huntamer and Smith. 1988. Ecology Lab Users Manual, Washington State Department of Ecology, Olympia, WA.

Kirchmer, C. 1988. Quality Assurance Manual, Manchester Laboratory, Washington State Department of Ecology, Manchester, WA.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: U.S. Army Corps of Engineers, Portland District (USACOE)

AREA OF STUDY: Willamette River-U.S. Moorings in Portland Harbor

SAMPLING MEDIA: Sediment samples (top 4 to 6.5 ft)

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Britton 1989

CONTACT: Mark Siipola, USACOE, Portland, OR

PHONE: (503) 326-6463

FAX: N/A

SAMPLING PERIOD: October 1991

NUMBER OF STATIONS SAMPLED: 3 stations

LOCATIONS OF STATIONS SAMPLED: Fifteen feet out from the berthing dock of the dredger Essayons at RM 6.2 of the Willamette River.

TARGET ANALYTES: Dioxins/furans; metals (Ag, As, Cd, Cr, Cu, Pb, Hg, Ni and Zn); phthalates; pesticides; PCBs; PAHs; and phenols. Conventional analyses included TOC and grain size.

ANALYTICAL TECHNIQUES: Dioxin/furan (EPA 8290); metals (EPA 3050), PAH, phthalates and phenols (EPA 8270); TOC (Standard Methods 502); pesticides and PCBs (EPA 8080). All results were reported on a dry weight basis. Total dioxin and furan concentrations were determined by the laboratory as the sum of the individual congeners that were detected.

SAMPLING EQUIPMENT USED: N/A

SAMPLE HANDLING AND PROCESSING: N/A

DATA GAPS: Latitude and longitude were not provided. Latitude and longitude were estimated for entry along with the data provided in the database.

ABSTRACT

At the request of CENPP-OP, a sediment evaluation was conducted on sediments at the U.S. Moorings, Willamette River mile 6.2 in order to evaluate dredging by the Essayons to increase depth. Previous studies suggested that sediments dredged from the U.S. Moorings should not be placed in unconfined in-water sites due to high levels of heavy metals, pesticides, PCBs and PAHs. Three samples were taken 15 feet out from the berthing dock and ranged from 4-6.5 feet in length. A sample composite was created using sub-samples of the sediment collected from stations M-1, M-2, and M-3 which was analyzed for dioxins and furans. This sample was renamed M-4 for entry in the database.

QA/QC EVALUATION - Surrogates were added to the sediments analyzed for organic compounds. Recoveries ranged from 62-121 percent. A reference sample was analyzed for metals and the certified concentrations were in good agreement with the analytical results.

The laboratory data were reviewed and data qualifiers were added as appropriate. The data qualifiers used were defined as follows:

JEstimated value when result in less than the specified quantitation limit.

UNot detected. Value is the detection limit.

DATA USE AND COMPARABILITY - Because PAH compounds were present at relatively high concentrations, the sediment extracts were diluted before quantification causing the detection limits to increase by a factor of five. Users of these data should be reminded that they were collected in the vicinity of potentially high levels of pollutants.

Only surface sediment analytical results have been entered in the database. The dioxin/furan analyses were performed on a composite of surface sediments collected from three locations.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Britton, J. 1989. Results of 1989 U.S. Moorings sediment quality evaluation. U.S. Army Corps of Engineers, Portland District, Portland, OR.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Oregon Department of Environmental Quality (ODEQ)/National Institutes of Health (NIH)

AREA OF STUDY: Willamette River-mainstem and Middle Fork

SAMPLING MEDIA: Surface sediment

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: Yes

REFERENCE SOURCE: Curtis et al. 1993

CONTACT: Lawrence R. Curtis, Oregon State University, Corvallis, OR

PHONE: (503) 737-1952

FAX: N/A

SAMPLING PERIOD: August 1990

NUMBER OF STATIONS SAMPLED: 6 stations

LOCATIONS OF STATIONS SAMPLED: Middle Fork (RK 314), Harrisburg (RK 250), Halsey (RK 232), Corvallis (RK 206), Salem (RK 116) and Portland (RK 11).

TARGET ANALYTES: 2,3,7,8-TCDD and -TCDF

ANALYTICAL TECHNIQUES: Described in Curtis et al. (1993). All results were reported on a dry weight basis.

SAMPLING EQUIPMENT USED: Stainless-steel Eckman dredge (0.23m²)

SAMPLE HANDLING AND PROCESSING: Each sediment sample consisted of a composite of three to five grab samples. Three composite samples were collected from each location. Subsamples were stored in glass jars at 4 °C.

DATA GAPS: Latitude and longitude of sampling sites. Latitude and longitude were estimated for entry along with the data provided in the database.

ABSTRACT

This study focused on determining the status and extent of contamination of TCDD and TCDF in the Willamette River due to industrial discharges. Sampling sites were selected based upon possible industrial pollution sources. A control site upstream from a bleached-kraft pulp mill discharge (RK 232), a site below a municipal sewage outfall (RK 206), and a site adjacent to an industrial waste dump contaminated with organochlorines (RK 11). Sampling and analysis included both fish and surface sediments. This study also included measurement of the specific tissue content of cytochrome P-450 1A1 as a bioindicator of contamination and assessed fish health by histopathology and clinical chemistry. Curtis et al. (1993,1991) contain provide summaries of these additional data.

QA/QC EVALUATION - A description of quality control/quality assurance procedures is provided in Curtis et al. (1993,1991). The only qualifier code used in the data set provided was "U" - Not detected. Value given is the detection limit.

DATA USE AND COMPARABILITY - The mean concentration of TCDD and TCDF in the three composite samples collected from each station have been entered in the database as provided in Curtis et al. (1993). Users of these data should be reminded that the sampling design targeted industrial and municipal discharge areas.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Curtis, L.R., H.M. Carpenter, R.M. Donohoe, D.E. Williams, O.R. Hedstrom, M.L. Deinzer, M.A. Beilstein, E. Foster, and R. Gates. 1993. Sensitivity of cytochrome P450-1A1 induction in fish as a biomarker for distribution of TCDD and TCDF in the Willamette River, Oregon. Environ. Sci. Technol. 27:2149-2157.

Curtis, L.R., H.M. Carpenter, R.R. Donahoe, M.L. Deinzer, M.A. Beilstein, D.E. Williams, and O.R. Hedstrom. 1991. Phase I final report (draft). Toxicity and longitudinal distribution of persistent organochlorines in the Willamette River. Prepared for Oregon Department of Environmental Quality, Portland, OR. Oregon State University, Fisheries and Wildlife, Corvallis, OR.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: City of Portland, Bureau of Environmental Services (PortlandBES)

AREA OF STUDY: Willamette River-Columbia Slough

SAMPLING MEDIA: Surface sediment (top 5 cm)

POSITIONING SYSTEM: Station locations were plotted on field copies of aerial photos and located using any identifying features not visible on maps or aerial photos and estimating distance from left/right bank.

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Dames and Moore 1991

CONTACT: Portland Bureau of Environmental Services, Portland, OR

PHONE: (505) 796-7740

FAX: N/A

SAMPLING PERIOD: June 1991

NUMBER OF STATIONS SAMPLED: 15 locations

LOCATIONS OF STATIONS SAMPLED: The Slough was divided into 15 locations. Sampling locations were selected in consultation with the City of Portland Bureau of Environmental Services staff and Multnomah County Drainage District No. 1 staff based upon four criteria: (1) proximity to suspected sources of sediment contamination such as CSOs, permitted discharges, stormwater outfalls, etc., (2) stations which had been previously sampled, (3) coverage of a wide area of the Slough and (4) access.

TARGET ANALYTES: 2,3,7,8-TCDD; volatile and semi-volatile organic compounds; PCBs; pesticides; and metals. Conventional analyses included TOC, grain size, and percent moisture.

ANALYTICAL TECHNIQUES: 2,3,7,8-TCDD (EPA 8290); volatile organics (EPA 8240); semi-volatile organics (EPA 8270), PCBs/chlorinated pesticides (EPA 8080); metals (EPA 6000/7000 series). All data entered in the database were reported in dry weight. Some data were reported on a wet weight basis, but these results were not entered in the database.

SAMPLING EQUIPMENT USED: 0.055 m² stainless-steel van Veen grab (Lower and Upper Slough), 0.025 m² stainless steel Ekman Dredge or by hand (Upper Slough).

SAMPLE HANDLING AND PROCESSING: Jars were filled, wrapped in bubble pack, bagged and sealed, placed in a cooler and shipped to the laboratory for analysis.

DATA GAPS: Latitude and longitude of sampling locations. Latitude and longitude were estimated for entry along with the data provided in the database.

ABSTRACT

The Columbia Slough, an important recreational resource for the people of Portland, runs east to west just north of Portland and extends for more than 18 miles. Several characterization studies have detected elevated levels of contaminants in both sediments and in some fish and invertebrates. This Phase I study intended to provide reconnaissance-level information on the slough sediments through more extensive sampling thereby increasing the existing data base on slough sediments and providing additional analytical tests and sediment bioassays. For the purposes of this report the upstream boundary of the slough is Fairview Lake at NE 201st, a distance more than 18 miles from the mouth of the Slough.

QA/QC EVALUATION - The analytical field screening methodologies were conducted in accordance with the Field Screening Methods Catalog, September, 1988, EPA/540/2-88/005. QA/QC samples were analyzed during each type of analysis. Daily method blank, matrix spike, and replicates were also analyzed.

The laboratory data were reviewed and data qualifiers were added as appropriate. The data qualifiers used were defined as follows:

JEstimated maximum possible concentration.

UNot detected. Value is the detection limit.

DATA USE AND COMPARABILITY - The sediment data have undergone review and validation. Data tables are included as Appendix C of Dames & Moore (1991).

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Dames & Moore. 1991. Columbia Slough sediment analysis and remediation project. Phase I report. Volume 1. Prepared for City of Portland, Bureau of Environmental Services. Dames & Moore, Portland, OR.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Washington State Department of Ecology (WDOE)

AREA OF STUDY: Lower Columbia River-Lonview

SAMPLING MEDIA: Surface sediment (top 2-3 cm)

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Das 1991

CONTACT: Tapas Das, WDOE, Olympia, WA

PHONE: (206) 407-6000

FAX: N/A

SAMPLING PERIOD: May 1991

NUMBER OF STATIONS SAMPLED: 3 stations

LOCATIONS OF STATIONS SAMPLED: Samples were collected 30 ft downstream from the Longview Fibre diffuser, 65 ft from the 310 ft long diffuser section, and 300 ft downstream of the diffuser.

TARGET ANALYTES: Dioxin and furans; volatile and semivolatile compounds; metals (Sb, As, Be, Cd, Cr, Cu, Pb, Hg, Ni, Se, Ag, Ti, and Zn); organochlorine pesticides and PCBs. Conventional analyses included TOC and grain size.

ANALYTICAL TECHNIQUES: Dioxins/furans (EPA 8290); metals (EPA 200), pesticides/PCBs (EPA 8080). All results were reported on a dry weight basis. Total dioxin and furan concentrations were determined by the laboratory as the sum of the individual congeners that were detected.

SAMPLING EQUIPMENT USED: 0.1 m² van Veer grab sampler

SAMPLE HANDLING AND PROCESSING: All samples consisted of 3-5 grab samples. Composite samples were placed on ice and delivered to the laboratory.

DATA GAPS: Latitude and longitude were not provided. Latitude and longitude were estimated for entry along with the data provided in the database.

ABSTRACT

The objectives of the Longview Fibre Company's Class II Inspection was to evaluate compliance with the NPDES permit (NPDES Permit No. WA-000007-8), determine the process wastewater secondary treatment removal efficiency, chemically characterize all effluents for priority pollutants and other pollutants of concern, and evaluate the biological toxicity of Longview Fibre's 001 effluent and outfall sediments with bioassays. The inspection also reviewed sampling methods and lab procedures to determine adherence to accepted protocols and advance state-of-the-art compliance inspections by contributing to ongoing developmental efforts with centrifugation.

QA/QC EVALUATION - Laboratory procedures which were followed are described by Kirchmer (1988) and Huntamer and Smith (1988). Matrix spikes, matrix duplicates, and relative percent differences of replicates were within QC limits.

The laboratory data were reviewed and data qualifiers were added as appropriate. The data qualifiers used were defined as follows:

JIndicates an estimated value when the result is less than the specified detection limit.

UNot detected. Value is the detection limit.

DATA USE AND COMPARABILITY - Users of these data should be reminded that they were collected in the vicinity of a potential source of industrial pollutants.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Das, T. 1991. Longview Fibre Company Class II Inspection. Washington State Department of Ecology, Environmental Investigations and Laboratory Services Program, Olympia, WA.

Huntamer and Smith. 1988. Ecology Lab Users Manual, Washington State Department of Ecology, Olympia, WA.

Kirchmer, C. 1988. Quality Assurance Manual. Manchester Laboratory, Washington State Department of Ecology, Manchester, WA.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: U.S. Environmental Protection Agency (USEPA)

AREA OF STUDY: Columbia River - RM 146-149 above Bonneville Dam

SAMPLING MEDIA: Surface sediment

ASSOCIATED TISSUE DATA: Yes

POSITIONING SYSTEM: Used physical landmarks (eg., dams) and river miles for sampling locations.

REFERENCE SOURCE: Davoli 1994

CONTACT: Dana Davoli, U.S. EPA, Seattle, WA

PHONE: (206) 553-2135

FAX: N/A

SAMPLING PERIOD: August-September 1994

NUMBER OF STATIONS SAMPLED: 2 stations

LOCATIONS OF STATIONS SAMPLED: RM 146-149 (in the area of crayfish sampling)

TARGET ANALYTES: Dioxin/furans; pesticides; PCBs; semi-volatiles including PAHs; metals (including Hg and As).

ANALYTICAL TECHNIQUES: Dioxins and furans (EPA Method 1613A); pesticides and PCBs (EPA 8081); semi-volatiles (EPA 8270/GPC); PAHs (EPA 8270); metals (EPA 200.3 and 6010A); Hg (EPA 7471A); As (200.3 and 7060A). Results are reported on a dry weight basis. Total dioxin and furan concentrations were determined by the laboratory as the sum of the individual congeners that were detected.

SAMPLING EQUIPMENT USED: N/A

SAMPLE HANDLING AND PROCESSING: Samples consist of a composite of five grabs per station.

DATA GAPS: None

ABSTRACT

The Columbia River and segments of the Snake and Willamette Rivers are currently water quality limited due to the presence of elevated levels of 2,3,7,8 - TCDD. As a result, U.S. EPA Region 10 established a Total Maximum Daily Load (TMDL) of 6 mg of 2,3,7,8-TCDD/day based upon state water quality standards applicable to the Columbia River basin and the volume of water in the Columbia River. This project is part of an effort to add to the data base on contaminant levels in aquatic organisms in the Columbia River. The project focused on one or two sampling locations in a limited segment of the river.

Criteria for choosing these locations were: (1) sampling at fishing sites has been limited, (2) collecting organisms that are consumed by Native Americans and others fishing in the Columbia River basin, (3) collecting organisms that are of good indicators of contaminant levels in the river and of levels of contaminants that may be ingested by aquatic and terrestrial predators. Sediment samples were taken between RM 146-149 and consisted of five grabs per station.

QA/QC EVALUATION - Internal standards, laboratory duplicates, matrix spikes, and method blanks were used for data evaluation.

The laboratory data were reviewed and data qualifiers were added as appropriate. The data qualifiers used were defined as follows:

BAAnalyte was also found in the method blank.

gResults confirmed on a DB-225 column.

JAnalyte was detected but the result should be considered an estimate.

NFor organic analytes there is evidence that the analyte is present in this sample. For metal analytes the spike recovery is not within control limits.

PDetected above the instrument detection limit but below the estimated minimum quantitation limit.

REJRejected data. Data are unusable for all purposes.

UNot detected. Value is the detection limit.

DATA USE AND COMPARABILITY - All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Davoli, D. 29 August 1994. Personal Communication (data package sent to Steve Ellis, Tetra Tech, Inc., Redmond, WA). Selected fish tissue contaminant data from the U.S. EPA Columbia River toxic substances study. U.S. Environmental Protection Agency, Region 10, Seattle, WA.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Washington State Department of Ecology (WDOE)

AREA OF STUDY: Lower Columbia River-Kalama

SAMPLING MEDIA: Surface sediment (top 2 cm)

POSITIONING SYSTEM: Stations were located and mapped by taking manual cross-bearings using prominent natural physical or manmade structures.

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Heffner 1989

CONTACT: Marc Heffner, WDOE, Olympia, WA

PHONE: (206) 407-6773

FAX: (206) 407-6715

SAMPLING PERIOD: May 1988

NUMBER OF STATIONS SAMPLED: 3 stations

LOCATIONS OF STATIONS SAMPLED: Station-1 (upstream)- 100 yards upstream of the Kalama Chemical dock off a log storage area; Station-2 (outfall)- downstream of the Kalama Chemical diffuser; Station-3 (downstream) - approximately 100 yards downstream of the Kalama Chemical dock.

TARGET ANALYTES: Metals (Sb, As, Be, Cd, Cr, Cu, Pb, Hg, Ni, Se, Ag, Tl, and Zn); volatile and semi-volatile organic compounds; organochlorine pesticides and Aroclor PCBs. Conventional analyses such as grain size, total solids, and TOC were also reported.

ANALYTICAL TECHNIQUES: Volatile organic compounds (EPA 8240); semi-volatile organic compounds (EPA 8270); metals (EPA 200); pesticides/PCBs (EPA 8080). All results are reported on dry weight basis.

SAMPLING EQUIPMENT USED: 0.1 m² van Veen grab sampler.

SAMPLE HANDLING AND PROCESSING: The top 2 cm of sediment from each of two grab samples collected from a station were composited for analysis. A bottle for analysis of volatile organics was filled directly from the sampler; one-half from each of the two grabs. The samples were stored on ice and shipped to the laboratory for analysis.

DATA GAPS: none

ABSTRACT

The study was a Class II Inspection of Kalama Chemical, Inc., an organic chemical manufacturer discharging both noncontact cooling water and treated process wastewater through a common outfall line into the Columbia River (NPDES Permit No. WA-000028-1) (Heffner 1989). The objectives of the Kalama Chemical Class II Inspection was to assess NPDES permit limit compliance with independent sample collection and laboratory analysis, determine sample and analytical accuracy (by dividing sample analysis between two laboratories), and to characterize discharge and receiving water sediment toxicity with conventional parameter analysis, priority pollutant scans, and bioassays. The sediment pollutant data are provided in the Appendix to the report, including the latitude and longitude of the sediment sampling locations (Heffner 1989).

QA/QC EVALUATION - QA/QC information provided was limited to the results of method blank analyses. Methylene chloride was detected in the sediment samples and in the method blank.

The laboratory data were reviewed and data qualifiers were added as appropriate. The data qualifiers used were defined as follows:

BAlyte was found in the blank sample. Possible/probable blank contamination.

JIndicates an estimated value when the result is less than the specified detection limit.

MEstimated value of analyte found and confirmed by analyst but with low spectral match parameters.

UNot detected. Value is the detection limit.

DATA USE AND COMPARABILITY - Users of these data should be reminded that they were collected in the vicinity of a potential source of industrial pollutants.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Heffner, M. 1989. Kalama Chemical, Inc. Class II Inspection, May 1988. Washington State Department of Ecology, Environmental Investigations and Laboratory Services Program, Olympia, WA.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Washington State Department of Ecology (WDOE)

AREA OF STUDY: Lower Columbia River-Longview

SAMPLING MEDIA: Surface sediment (top 2 cm)

POSITIONING SYSTEM: Stations were located and mapped by taking manual cross-bearings using prominent natural physical or manmade structures.

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Heffner 1991

CONTACT: Marc Heffner, WDOE, Olympia, WA

PHONE: (206) 407-6773

FAX: (206) 407-6715

SAMPLING PERIOD: February 1990

NUMBER OF STATIONS SAMPLED: 3 stations

LOCATIONS OF STATIONS SAMPLED: The sampling locations were near the Reynolds Metals Company aluminum smelter's five point discharges. An upstream station located approximately 500 yards upstream of the primary outfall, a stations 10 yards downstream of the outfall diffuser, and a station 300 feet downstream of the diffuser at the edge of the dilution zone.

TARGET ANALYTES: Metals (Sb, As, Be, Cd, Cr, Cu, Pb, Hg, Ni, Se, Ag, Tl, Zn, Al); volatile and semi-volatile organic compounds; organochlorine pesticides and PCBs. Results were also provided for fluoride, cyanide, TOC, grain size, and percent solids.

ANALYTICAL TECHNIQUES: Volatiles (EPA 8240); semi-volatiles (EPA 8270); metals (EPA 200); pesticides/PCBs (EPA 8080). All results are reported on a dry weight basis.

SAMPLING EQUIPMENT USED: 0.1 m² van Veen grab sampler.

SAMPLE HANDLING AND PROCESSING: Samples were removed from the upper 2 cm of each grab sample and composited for analysis. Volatile samples were collected from the first grab sample collected from each station. Samples were immediately stored on ice at 4° C for transport to the laboratory.

DATA GAPS: Latitude and longitude were not provided. Latitude and longitude were estimated for entry along with the data provided in the database.

ABSTRACT

The objectives of the Reynolds Metals Company's aluminum smelter Class II Inspection was to verify effluent compliance with NPDES permits (NPDES Permit No. WA-00008-6 and Order 89-3), characterize priority pollutants in the 002 discharge stream and in sediments near the outfall, and evaluate the effluent and sediments for toxicity using a series of bioassays (Heffner 1991). The inspection also reviewed lab procedures at the mill to determine adherence to accepted protocols and advance state-of-the-art compliance inspections by contributing to ongoing developmental efforts with centrifugation. Samples of sediments were taken at locations upstream and downstream from the facility and downstream immediately in the vicinity of the outfall diffuser.

QA/QC EVALUATION - QA/QC information provided was limited to the results of transport blank analyses. Methylene chloride, acetone, and bis(2-ethylhexyl)phthalate were detected in the sediment samples and in the transport blank.

The laboratory data were reviewed and data qualifiers were added as appropriate. The data qualifiers used were defined as follows:

BAAnalyte was also detected in the method blank.

JEstimated value less than the specified detection limit.

UNot detected. Value is the detection limit.

DATA USE AND COMPARABILITY - Users of these data should be reminded that they were collected in the vicinity of a potential source of industrial pollutants.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Heffner, M. 1991. Reynolds Metal Company Class II Inspection, February 1990. Washington State Department of Ecology, Environmental Investigations and Laboratory Services Program, Olympia, WA.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: U.S. Geological Survey (USGS)

AREA OF STUDY: Lake Couer d' Alene

SAMPLING MEDIA: Surface sediment (top 2 cm)

POSITIONING SYSTEM: Stations were located and mapped by taking manual cross-bearings using prominent natural physical or manmade structures, or both.

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Horowitz and Elrick 1993

CONTACT: Arthur J. Horowitz

PHONE: (404) 903-9100

FAX: N/A

SAMPLING PERIOD: August 1989

NUMBER OF STATIONS SAMPLED: Greater than 150 locations were sampled. However, unsummarized data were provided for only seven stations in Lake Coeur d' Alene. These stations were identified as stations with elevated metals content.

LOCATIONS OF STATIONS SAMPLED: Lake Coeur d' Alene near Independence Pt. (CDA32), Wolf Lodge Bay (CDA22A), Black Rock Bay (CDA93), Windy Bay (CDA100), Harlow Pt. (CDA119), Harrison (CDA128), and Conkling Point (CDA155).

TARGET ANALYTES: Trace and major elements including: Ag, Al, As, Cd, Co, Cr, Cu, Fe, Hg, Ni, Mn, Pb, Sb, Se, Ti and Zn. Sediment TOC content was also determined.

ANALYTICAL TECHNIQUES: Sediments were ground to < 100 mesh and digested with strong acid (HF-HClO₄-aqua regia) at 200° C. All metals were analyzed by flame AAS except for As, Sb, and Se which were determined by hydride generation AAS and mercury which was determined using the cold vapor technique. Bulk sediments and specific grain size fractions were analyzed. Only the bulk sediment analyses were entered in the database.

SAMPLING EQUIPMENT USED: Stainless-steel Ekmann grab sampler.

SAMPLE HANDLING AND PROCESSING: Subsamples were removed from the upper 2 cm of sediment in each grab and immediately stored on ice at 4° C.

DATA GAPS: Latitude and longitude were not provided. Latitude and longitude were estimated for entry along with the data provided in the database.

ABSTRACT

The purpose of the USGS study was to determine the trace element concentrations, partitioning, and distribution in the sediment column and to relate them to mining, and mining related discharge operations that have occurred in the Coeur d'Alene (CDA) district since the 1880's. Surface bed sediment samples were collected from Lake Coeur d'Alene, ID in August 1989 and bulk surface sediment chemistry data for the most metal-enriched locations were provided in Table III and have been entered in the database (Horowitz and Elrick 1993). Additional data provided on the metal content of individual grain size fractions were also provided in Table III, but these data have not been entered in the database. The results of analysis of subsurface sediment samples have also been reported (Horowitz et al. 1993), but these data have not been entered in the database.

QA/QC EVALUATION - Precision and bias for the chemical analyses were monitored by replicate analyses of selected samples and by the concomitant digestion and analysis of NIST reference sediment and USGS rock and soil standards. Precision was usually better than ± 10 percent; no bias was detected. The only qualifier code used in the data set provided was "U" - Not detected. Value given is the detection limit.

DATA USE AND COMPARABILITY - When comparing these data to other similar sediment trace metal data sets, the user should remember that these results are for the stations identified as those with the highest metal content.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Horowitz, A.J. and K.A. Elrick. 1993. Effect of mining and related activities on the sediment trace element geochemistry of Lake Coeur d'Alene, Idaho, USA. Part I. Surface sediments. Hydrological Processes 7:403-423.

Horowitz, A.J., K.A. Elrick, J.A. Robbins, and R.B. Cook. 1993. The effect of mining and related activities on the sediment-trace element geochemistry of Lake Coeur d'Alene, Idaho. Part II: Subsurface sediments. U.S. Geological Survey, Atlanta, GA. Open-File Report 93-656.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Washington Department of Ecology (WDOE)

AREA OF STUDY: Columbia River (Lake Roosevelt, Rufus Woods Lake) and Long Lake (Spokane River)

SAMPLING MEDIA: Surface sediment (top 2 cm)

ASSOCIATED TISSUE DATA: Yes

POSITIONING SYSTEM: N/A

REFERENCE SOURCE: Johnson 1991

CONTACT: Art Johnson, WDOE, Olympia, WA

PHONE: (206) 407-6715

FAX: (206) 407-6670

SAMPLING PERIOD: June 1990

NUMBER OF STATIONS SAMPLED: 8 stations

LOCATIONS OF STATIONS SAMPLED: Six sites in Lake Roosevelt between the international border and Grand Coulee Dam, one site each in the Spokane River and Rufus Woods Lake.

TARGET ANALYTES: Dioxin and furans; PCBs and pesticides; additional organic compounds; mercury.

ANALYTICAL TECHNIQUES: Analysis methods are as described in Call et al. (1991). All data are reported on a dry weight basis. Total PCB concentration was determined by the author as the sum of mono- through decachloro PCBs that were detected.

SAMPLING EQUIPMENT USED: 0.1 m² van Veen grab sampler

SAMPLE HANDLING AND PROCESSING: Sample containers were 8 oz. amber glass with teflon lid-liners. Samples were stored on ice in the field prior to shipping to the laboratory.

DATA GAPS: None

ABSTRACT

In June 1990, as part of Ecology's investigation of contaminants in Lake Roosevelt, a series of sediment and bottom fish samples were collected from Lake Roosevelt and vicinity for analysis of PCDDs and PCDFs. The impetus for this survey was the need to better understand the spatial distribution of these compounds as a result of their discharge by the Celgar bleached kraft pulp mill in Castlegar, BC, approximately 30 river miles above the international boundary. The results of these and other PCDD/PCDF analyses on Lake Roosevelt samples have been reported elsewhere (Johnson et al. 1991a,b). The report that serves as the source of the additional analytical data contains results of analysis of sediment and bottom fish samples for 44 additional xenobiotic compounds (Johnson 1991).

QA/QC EVALUATION - QA procedures for these analyses were established by the EPA Duluth laboratory (U.S. EPA 1990). All data included in the present report passed EPA's quality assurance criteria.

The laboratory data were reviewed and data qualifiers were added as appropriate. The data qualifiers used were defined as follows:

DBelow quantitation limit for PCBs. Reported concentration not included in total.

UNot detected. Value is the detection limit.

DATA USE AND COMPARABILITY - All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Call, D.J. et al., 1991. Sediment Quality Evaluation in the Lower Fox River in South Green Bay of Lake Michigan. Center for Lake Superior Environmental Studies, University of Wisconsin, Superior, EPA Coop. Agreement No. CR-815232.

Johnson, A. 1991. Results of screen for EPA xenobiotics in sediment and bottom fish from Lake Roosevelt (Columbia River). Memo to Mr. Carl Nuechterlein, Washington Department of Ecology, Olympia, WA. 22 July 1991.

Johnson, A., D. Serder, and D. Norton. 1991a. Spatial Trends in TCDD/TCDF Concentrations and Bottom Fish Collected in Lake Roosevelt (Columbia River), Washington Department of Ecology, Environmental Investigations and Laboratory Services, Publication No. 91-29.

Johnson, A., D. Serder, and S. Magoon. 1991b. Polychlorinated dioxins and -furans in Lake Roosevelt (Columbia River) sportfish, 1990. Washington State Department of Ecology, Olympia, WA. Pub. No. 91-4.

U.S. EPA. 1990. Analytical procedures and quality assurance plan for determination of PCDD/PCDF

in fish. EPA Duluth ORD. EPA/600/3-90/022.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Washington Department of Ecology (WDOE)

AREA OF STUDY: Columbia River-Lake Wallula

SAMPLING MEDIA: Surface sediment (top 2 cm)

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Johnson and Heffner 1993

CONTACT: Art Johnson, WDOE, Olympia, WA

PHONE: (206) 407-6715

SAMPLING PERIOD: April 1992

FAX: (

NUMBER OF STATIONS SAMPLED: 4 stations

LOCATIONS OF STATIONS SAMPLED: Lake Wallula area: Badger Island, Old Outfall, Port Kelley and Hat Rock.

TARGET ANALYTES: Dioxins and furans; metals; PCBs; organochlorine pesticides; volatiles; semi-volatiles.

ANALYTICAL TECHNIQUES: Volatiles (EPA Method 8240); OC pesticides (EPA Method 8080); semi-volatiles (EPA Method 8270); Dioxins and furans (EPA Method 8290); Priority metals (EPA Method 200); Cr (EPA Method 7195); CN (ALPHA 45000-CN). All data are reported on a dry weight basis. Total dioxin and furan concentrations were determined by the laboratory as the sum of the individual congeners that were detected.

SAMPLING EQUIPMENT USED: Stainless steel Ponar grab sampler

SAMPLE HANDLING AND PROCESSING: Sediment samples consisted of a homogenized composite of 3 grab samples. Samples were shipped on ice to laboratory. Sample chain-of-custody procedures were followed.

DATA GAPS: none

ABSTRACT

The Department of Ecology (WDOE) conducted a Class II Inspection of the Boise Cascade Corp. bleached kraft pulp and paper mill at Wallula, WA during April of 1992. The mill is located on the east shore of the Columbia River (Lake Wallula) about 15 miles southeast of Pasco. It discharges an average of 30 million gallons per day of secondary treated effluent and non-contact cooling water to the Columbia via a mid-channel diffuser at RM 316 (NPDES permit No. WA 000369-7). The primary objectives of this inspection were to: verify compliance with NPDES permit limits, assess potential for the effluent to cause aquatic toxicity, evaluate efficiency of wastewater treatment, obtain data on dioxins and other toxics in bleach plant effluents and in sludges and to survey the Columbia River sediment quality above and below the mill.

QA/QC EVALUATION - Written QA reviews were prepared by the Manchester Laboratory for all laboratory data contained in this report. QA measures included an assessment of sample holding times, instrument calibration, method blanks, spike and surrogate recoveries and precision data. All chemical data are considered acceptable for use with the qualifiers provided.

The laboratory data were reviewed and data qualifiers were added as appropriate. The data qualifiers used were defined as follows:

BAAnalyte also found in laboratory blank.

EEstimated maximum possible concentration.

JEstimated concentration.

NSpike recovery outside of laboratory control limits.

PFor metals "P" indicates that analyte detected below quantitation limit. For dioxin and furan congeners "P" indicates that there were poorly resolved gas chromatograph peaks.

QQuantitative interference.

UNot detected. Value is the detection limit.

DATA USE AND COMPARABILITY - Data not meeting project guidelines for laboratory precision or accuracy have been qualified where appropriate.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Johnson, A. and M. Heffner. 1993. Class II inspection of the Boise Cascade Pulp & Paper Mill, Wallula, Washington - April 1992. Washington State Department of Ecology, Environmental Investigations and Laboratory Services Program, Olympia, WA.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Washington Department of Ecology

AREA OF STUDY: Lower Columbia River-Ilwaco to Vancouver

SAMPLING MEDIA: Surface sediment (top 2 cm)

POSITIONING SYSTEM: Targeted five ports along the lower Columbia River.

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Johnson and Norton 1988

CONTACT: Art Johnson, WDOE, Olympia, WA

PHONE: (206) 407-6715

FAX: (206) 407-6670

SAMPLING PERIOD: September 22-24, 1987

NUMBER OF STATIONS SAMPLED: 10 locations

LOCATIONS OF STATIONS SAMPLED: Reed Island, Camas Slough, Vancouver lower turning basin, Vancouver below VANALCO, Kalama Chemical pier, below Longview Fibre, Longview below Weyco, Longview below Reynolds, Coal Creek Slough, and Ilwaco boat basin.

TARGET ANALYTES: Seventeen metals, volatile and semi-volatile organics, organochlorine pesticides and PCBs, cyanide, resin acids, grain size, and total organic carbon.

ANALYTICAL TECHNIQUES: Metals and cyanide were analyzed by methods described in EPA (1979). Volatile and semi-volatile organics, pesticides, and PCBs were analyzed by methods described in EPA (1984). Resin acids, total organic carbon, and grain size were analyzed according to methodology described in NCASI (1986), APHA (1985), and Holme and McIntyre (1971), respectively. All results are reported on a dry weight basis. Total resin acids are reported as the sum of detected resin acid compounds.

SAMPLING EQUIPMENT USED: 0.1 m² van Veen grab sampler.

SAMPLE HANDLING AND PROCESSING: Each sediment sample consisted of a composite of two to three grab samples. Surface sediment samples (top 2 cm) were transferred to stainless steel beakers and homogenized by stirring with stainless steel spoons. Samples for volatile organic analysis were placed in 40 ml glass vials with no head space prior to homogenizing. All samples were stored on ice.

DATA GAPS: Latitude and longitude of sampling locations were not provided. Latitude and longitude

were estimated for entry along with the data provided in the database.

ABSTRACT

At the request of the Ecology Southwest Regional Office, the Toxics Investigations/Ground Water Monitoring Section conducted a reconnaissance survey of sediment quality at five ports along the lower Columbia River. Objectives of the survey were to characterize the occurrence of toxic chemicals in the sediments and assess the potential for sediment toxicity. Two acute bioassays were performed to assess sediment toxicity, *Hyalella azteca* and *Daphnia pulex*. The results of the bioassays are described in Johnson and Norton (1988).

QA/QC EVALUATION - Quality assurance followed standard Manchester laboratory practice described by Huntamer (1986). Method blanks, matrix spikes, duplicates, and surrogate compound spikes (for organic analyses) were included in the quality assurance program. All data met EPA Contract Laboratory Program criteria with the following exceptions: The fourteen day holding time for volatile organics analysis was exceeded by seven days and the results for antimony and a resin acid (neoabietic acid) are suspect.

The laboratory data were reviewed and data qualifiers were added as appropriate. The data qualifiers used were defined as follows:

BAAlso detected in laboratory blank.

JEstimated concentration.

UNot detected. Value is the detection limit.

DATA USE AND COMPARABILITY - Users of these data should bear in mind that the sediments were collected in the vicinity of potential pollutant sources. Results for antimony and neoabietic acid are suspect.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

American Public Health Association (APHA). 1985. Standards methods for the examination of water and wastewater, 16th ed. Washington, D.C.

Holme, N.A. and A.D. McIntyre. 1971. Methods for the study of marine benthos. IBP Handbook No. 16.

Huntamer, D. 1986. Department of Ecology, Laboratory User's Manual. Manchester Environmental Laboratory, Manchester, WA.

Johnson, A. and D. Norton. 1988. Screening survey for chemical contaminants and toxicity in sediments at five lower Columbia River ports September 22-24, 1987. Washington Department of

Ecology, Toxics Investigations/Ground Water Monitoring Section, Olympia, WA.

National Council for Air and Stream Improvement (NCASI). 1986. Procedures for the analysis of resin and fatty acids in pulp mill effluents. Tech. Bull. 501. New York, NY.

U.S. EPA. 1979. Methods for chemical analysis of water and wastes.

U.S. EPA. 1984. Guidelines establishing test procedures for the analysis of pollutants under the Clean Water Act: Final rule and final interim rule and proposed rule. Federal Register 40 (209) 1-210.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Washington State Department of Ecology (WDOE)

AREA OF STUDY: Columbia River (Lake Roosevelt, Rufus Woods Lake) and Long Lake (Spokane River)

SAMPLING MEDIA: Surface sediment (top 2 cm)

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: Yes

REFERENCE SOURCE: Johnson et al. 1991a

CONTACT: Art Johnson, WDOE, Olympia, WA

PHONE: (206) 407-6670

FAX: (206) 407-6715

SAMPLING PERIOD: June 1990

NUMBER OF STATIONS SAMPLED: 8 stations

LOCATIONS OF STATIONS SAMPLED: Six stations in Lake Roosevelt, one in the Spokane River (Long Lake) and one in Rufus Woods Lake.

TARGET ANALYTES: Fifteen 2,3,7,8-substituted PCDDs and PCDFs. Octachlorodibenzodioxin and octachlorodibenzofuran were not reported. Conventional analyses included sediment grain size and total organic carbon content.

ANALYTICAL TECHNIQUES: PCDD/PCDF analysis followed methods described in EPA (1990) and EPA et al. (1990) and was performed by the EPA Environmental Research Laboratory in Duluth, MN. All data are reported on a dry weight basis.

SAMPLING EQUIPMENT USED: 0.1 m² stainless-steel van Veen grab sampler.

SAMPLE HANDLING AND PROCESSING: Each sediment sample consisted of a composite of three grab samples. Surface sediment samples (top 2 cm) were transferred to stainless-steel beakers and homogenized by stirring with stainless-steel spoons. Samples were stored on ice in the field.

DATA GAPS: none

ABSTRACT

In June 1990, as part of Ecology's investigation of contaminants in Lake Roosevelt, a series of sediment

and bottom fish samples were collected from Lake Roosevelt and vicinity for analysis of PCDDs and PCDFs (Johnson et al. 1991a). The objective of the survey was to evaluate the transport and distribution of these compounds throughout the lake. The sediments and bottom fish collected during this effort were also analyzed for additional xenobiotic compounds. These data are reported in Johnson (1991). Other Ecology reports describe results from analysis of Lake Roosevelt sportfish and suspended matter samples for dioxins and furans (Johnson et al. 1991b,c).

QA/QC EVALUATION - QA procedures followed during PCDD/PCDF analysis were established by EPA Duluth Laboratory (U.S. EPA 1990; U.S. EPA et al. 1990). All data included in this report passed EPA's quality assurance criteria.

Duplicate samples were submitted to assess the precision of the analysis. Close agreement was reached between duplicate sample analyses.

The laboratory data were reviewed and data qualifiers were added as appropriate. However, the only data qualifier that could be defined was "U" - Not detected. Value is the detection limit. The other qualifier codes: QR, QR18, QR32, and QR89 indicated data that were unusable. Analyses with these qualifier codes were reported by the Environmental Research Laboratory in Duluth, MN.

DATA USE AND COMPARABILITY - Data used for this report were from the lab data sheets provided in the appendix of the report. Fish and sediment sample analysis results as a function of river miles below the Canadian border (a large pulp and paper mill is located north of the border in Castlegar, BC) were compared for assessment of spatial trends.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.
REFERENCES:

Johnson, A. 1991. Results of screen for EPA xenobiotics in sediment and bottom fish from Lake Roosevelt (Columbia River). Memo to Mr. Carl Nuechterlein, Washington Department of Ecology, Olympia, WA. 22 July 1991.

Johnson, A., D. Norton, and W. Yake. 1988. An assessment of metals contamination in Lake Roosevelt. Washington State Department of Ecology, Olympia, WA.

Johnson, A., D. Serder, and D. Norton. 1991a. Spatial trends in TCDD/TCDF concentrations in sediment and bottom fish collected in Lake Roosevelt (Columbia River). Washington Department of Ecology, Environmental Investigations and Laboratory Services, Olympia, WA. Publication No. 91-29.

Johnson, A., D. Serder, and S. Magoon. 1991b. Polychlorinated dioxins and -furans in Lake Roosevelt (Columbia River) sportfish, 1990. Washington State Department of Ecology, Olympia, WA. Pub. No. 91-4.

Johnson, A., D. Serder, and K. Seiders, 1991c. PCDDs/PCDFs in Columbia River suspended particulate matter. Memorandum to C. Nuechterlein and S. Saunders. Washington State Department of Ecology, Olympia, WA.

U.S. EPA. 1990. Analytical procedures and quality assurance plan for determination of PCDD/PCDF

in fish. EPA/600/3-90/022. U.S. EPA, Office of Research and Development, Duluth, MN.

U.S. EPA/New York Department of Environmental Conservation/New York Department of Health/Occidental Chemical Corp. 1990. Analytical procedures and quality assurance plan for the determination of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD) in fish, water and sediment. Vol. III. In: Lake Ontario TCDD Bioaccumulation Study - Final Report.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Washington Department of Ecology (WDOE)

AREA OF STUDY: Columbia River-U.S./Canadian border

SAMPLING MEDIA: Suspended particulate matter; (depth ranged from 1-4 feet)

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Johnson et al. 1991c

CONTACT: Art Johnson, WDOE, Olympia, WA

PHONE: (206) 407-6715

FAX: (206) 407-6670

SAMPLING PERIOD: October 1990

NUMBER OF STATIONS SAMPLED: 1 station

LOCATIONS OF STATIONS SAMPLED: Northport

TARGET ANALYTES: 17 congeners of dioxins and furans.

ANALYTICAL TECHNIQUES: Dioxins and furans (EPA Method 8290). Data are reported in dry weight. Total dioxin and furan concentrations were determined by the laboratory as the sum of the individual congeners that were detected.

SAMPLING EQUIPMENT USED: Two SediSamp System II continuous centrifuges (model 101IL).

SAMPLE HANDLING AND PROCESSING: The centrifuges were operated simultaneously over a period of approximately 57 hours starting at 2315 hour on October 9 and ending at 0836 on October 12th. Flow rate was 1.2 gallons/minute with a total of 4.082 gallons of water passing through the centrifuge.

DATA GAPS: none

ABSTRACT

The Department of Ecology (WDOE) conducted a sampling of suspended particulate matter (SPM) from the Columbia River at Northport as part of an investigation into the impact on Lake Roosevelt of discharges from the Celgar bleached kraft pulp mill in Castlegar, B.C (Johnson et al. 1991). The objectives of this study were to make the first determination of PCDD/PCDF concentrations in Columbia River water, obtain a preliminary estimate of loads to Lake Roosevelt and provide data to the Water Quality Program and EPA to assist in refinement of the Columbia River total maximum daily load for 2,3,7,8-TCDD. The field work was conducted with an extensive Environment Canada study of water quality in the border reach of the Columbia River which included SPM samples for PCDDs/PCDFs.

QA/QC EVALUATION - QA measures included matrix spikes and centrifuge blanks.

The laboratory data were reviewed and data qualifiers were added as appropriate. However, the only data qualifier that could be defined was "U" - Not detected. The "B" qualifier indicated that the analyte was also detected in the laboratory blank sample. Value is the detection limit. The qualifier code "F" was not defined. Analyses with these qualifier codes were reported by Alta Laboratory.

DATA USE AND COMPARABILITY - Users of these data should be aware that they are from only one sampling area.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Johnson, A., D. Serdar, and K. Seiders. 1991. PCDDs/PCDFs in Columbia River suspended particulate matter. Memorandum to C. Neuchterlein and S. Saunders. Washington State Department of Ecology, Olympia, WA.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Washington Department of Ecology (WDOE)

AREA OF STUDY: Columbia River (Lake Roosevelt, Canadian Border-Lower Arrow Lake)

SAMPLING MEDIA: Surface sediments (top 2-4 cm)

ASSOCIATED TISSUE DATA: Yes

POSITIONING SYSTEM: N/A

REFERENCE SOURCE: Johnson et al. 1988b

CONTACT: Art Johnson, WDOE, Olympia, WA

PHONE: (206) 407-6715

FAX: N/A

SAMPLING PERIOD: August 1986

NUMBER OF STATIONS SAMPLED: 17 stations

LOCATIONS OF STATIONS SAMPLED: Lake Roosevelt area: collected as a series of grabs in a longitudinal transect from the international border to Grand Coulee Dam; collected at the mouths of the Colville, Kettle, Spokane and Sanpoil Rivers.

TARGET ANALYTES: Metals (Zn, Cu, Pb, As, Cd, Hg).

ANALYTICAL TECHNIQUES: Zn (EPA 289.2); Cu (EPA 220.2); Pb (EPA 239.2); As (EPA 206.2); Cd (EPA 213.2) and Hg (in-house). All data are reported on a dry weight basis.

SAMPLING EQUIPMENT USED: Van Veen grab sampler or Emery pipe dredge.

SAMPLE HANDLING AND PROCESSING: Sample containers were glass jars with teflon lids and were stored on ice prior to shipping to the laboratory.

DATA GAPS: none

ABSTRACT

In response to reports of elevated metals concentrations in fish and other environmental samples from

Lake Roosevelt, Ecology conducted a series of field surveys between May and September 1986 to determine the extent and significance of contamination (Johnson et al. 1988). Sediment, water samples and a variety of fish species were used in this assessment. These data were also summarized in a journal article (Johnson et al. 1990).

QA/QC EVALUATION - The accuracy and precision of the metals data were assessed by analysis of standard reference materials, laboratory duplicates field replicates and field blanks. Results were in good agreement with certified values. No data were qualified.

DATA USE AND COMPARABILITY - The data appear to be of good quality and have undergone and have undergone review and validation.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Johnson, A., D. Norton, and B. Yake. 1988 (Revised 1989). An assessment of metals contamination in Lake Roosevelt. Washington Department of Ecology, Toxics Investigations/Ground Water Monitoring Section, Olympia, WA.

Johnson, A., D. Norton, B. Yake, and S. Twiss. 1990. Transboundary metal pollution of the Columbia River (Franklin D. Roosevelt Lake). Bull. Environ. Contam. Toxicol. 45:703-710.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Washington State Department of Ecology (WDOE)

AREA OF STUDY: Yakima River-RM 18 to 183

SAMPLING MEDIA: Surface sediment (top 2 cm)

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: Yes

REFERENCE SOURCE: Johnson et al. 1986

CONTACT: Art Johnson, WDOE, Olympia, WA

PHONE: (206) 407-6715

FAX: (206) 407-6670

SAMPLING PERIOD: September 1985

NUMBER OF STATIONS SAMPLED: 13 stations

LOCATIONS OF STATIONS SAMPLED: Along the Yakima River between Horn Rapids Dam and Cle Elum - River Miles 18.0 to 183.1, respectively.

TARGET ANALYTES: Organochlorine pesticides, Aroclor PCBs, and Hg were the target analytes, but only the frequently detected organochlorine compounds were reported. Mercury was detected in all samples. Therefore, the database contains only p,p'-DDT, -DDE, -DDD and o,p'-DDT results. Results for dieldrin, endosulfan, aldrin, Aroclor PCBs, and mercury are also included. Conventional analyses included sediment grain size, percent dry weight and total organic carbon content.

ANALYTICAL TECHNIQUES: Organochlorine pesticides and PCBs (EPA 608, additional information on analysis is provided in Appendix II of the document); Mercury (EPA 245.2 with modifications). All results are reported on dry weight basis. Total DDT concentrations reported are based on the sum of detected concentrations of o,p'- and p,p'-DDT, DDE, and DDD compounds.

SAMPLING EQUIPMENT USED: Stainless-steel Ponar grab used in slow-moving water; Stainless-steel Emery pipe dredge in fast water.

SAMPLE HANDLING AND PROCESSING: Each sediment sample was homogenized by stirring with stainless-steel spoons, stored in containers, immediately placed on ice, and shipped to the laboratory.

DATA GAPS: Latitude and longitude of sampling locations was not provided in the report. Latitude and longitude were estimated for entry along with the data provided in the database.

ABSTRACT

This study was conducted in 1985 by Ecology's Water Quality Investigations Section in response to results from the Basic Water Monitoring Program (BWMP) which showed higher levels of DDT and metabolites DDE and DDD in Yakima River fish than elsewhere in Washington State between 1979 and 1984. The study's objective was to evaluate the hazards to human health and aquatic life, identify sources and determine if contamination was primarily due to recent illegal use or historical applications (Johnson et al. 1986). Fish, water, and bed sediments were analyzed. Sediment samples were collected from the Yakima main stem and from tributaries considered to have greatest potential for DDT contamination. These data were also summarized and reported in a journal publication (Johnson et al. 1988).

QA/QC EVALUATION - QA/QC included interlaboratory comparisons between the Ecology/EPA Manchester laboratory and California Analytical Laboratories (CAL), analysis of matrix spikes and matrix spike duplicates, duplicate samples, and analysis of standard reference materials. CAL was the contract laboratory responsible for the fish tissue organochlorine analyses. The Ecology/EPA Manchester laboratory was responsible for the sediment organochlorine and mercury analyses and fish tissue mercury analyses. Data provided by CAL were reviewed by the Manchester laboratory.

The laboratory data were reviewed and data qualifiers were added as appropriate. The data qualifiers used were defined as follows:

JEstimated concentration.

UNot detected. Value is the detection limit.

DATA USE AND COMPARABILITY - In general, sediment samples were collected in the vicinity of suspected sources of DDT. All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Johnson, A., D. Norton, and W. Yake. 1986. Occurrence and significance of DDT compounds and other contaminants in fish, water and sediment from the Yakima River Basin. Washington State Department of Ecology, Olympia, WA.

Johnson, A., D. Norton, and B. Yake. 1988. Persistence of DDT in the Yakima River drainage, Washington. Arch. Environ. Contam. Toxicol. 17:289-297.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: National Oceanic and Atmospheric Administration (NOAA)

AREA OF STUDY: Lower Columbia River - Youngs Bay and river mouth

SAMPLING MEDIA: Surface sediment

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: NOAA 1991

CONTACT: Tom O'Connell, NS&T Program, NOAA, Rockville, MD

PHONE: (301) 713-3028

FAX: N/A

SAMPLING PERIOD: 1986-1989

NUMBER OF STATIONS SAMPLED: 3 locations.

LOCATIONS OF STATIONS SAMPLED: Lower Columbia River (Youngs Bay, North and South Jetty).

TARGET ANALYTES: Metals (Ag, As, Cd, Cr, Cu, Hg, Pb, Sn, Zn); low and high molecular weight PAHs; pesticides and PCBs.

ANALYTICAL TECHNIQUES: Organic analysis as described in MacLeod et al, 1985 and Wade et al., 1988. Metals analyzed by atomic absorption or X-ray fluorescence. All data are reported on a dry weight basis.

SAMPLING EQUIPMENT USED: A specially constructed box corer or a standard Smith-MacIntyre bottom grab.

SAMPLE HANDLING AND PROCESSING: Three grabs or cores were obtained at each of three stations at a site. Three composite samples were then made from each station for the various analyses.

DATA GAPS: none

ABSTRACT

NOAA's National Status and Trends Program has analyzed samples of surface sediments collected at almost 300 coastal and estuary sites throughout the United States since 1984 (NOAA 1991). These locations have also been sampled to determine contaminant levels in biota as part of NOAA's Mussel Watch program (NOAA 1989). However, the tissue data have not been entered in the database because the tissue contaminant data were reported on a dry weight basis.

The program's objectives include defining the geographical distribution of contaminant concentrations in tissues of marine organisms and in sediments and documenting biological responses to contamination. Because this objective was to quantify contamination over general areas, sites were selected so that they were not in close proximity to major sources of contamination. Sites in the Columbia River Basin include the North and South Jetty and Youngs Bay.

QA/QC EVALUATION - QA measures include: interlaboratory comparisons of analytical results, periodic QA workshops, development of Standard Reference Materials and Interim Reference Materials for marine sediments and tissues and use of a standardized data base for QA data and information.

The only qualifier code used in the data set provided was "U" - Not detected. Value given is the detection limit.

DATA USE AND COMPARABILITY - All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

MacLeod, W.D., Jr., D.W. Brown, A.S. Friedman, D.G. Burrows, O. Maynes, R. Pearce, C.A. Wigren and R.G. Bogar. 1985. Standard analytical procedures of the NOAA National Analytical Facility, 1985-1986: Extractable toxic organic compounds, 2nd edition. NOAA Technical Memorandum NMFS F/NWC-92.

National Oceanic and Atmospheric Administration (NOAA). 1991. National Status and Trends Program for marine environmental quality. Progress Report: Second summary of data on chemical contaminants in sediments from the National Status and Trends Program. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Office of Oceanography and Marine Assessment, Rockville, MD. NOAA Technical Memorandum NOS OMA 59.

National Oceanic and Atmospheric Administration (NOAA). 1989. National Status and Trends Program for marine environmental quality. Progress Report: A summary of data on tissue contamination from the first three years (1986-1988) of the Mussel Watch Project. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Office of Oceanography and Marine Assessment, Rockville, MD. NOAA Technical Memorandum NOS OMA 49.

Wade, T.L., E.L. Atlas, J.M. Brooks, M.C. Kennicutt II, R.G. Fox, J. Sericano, B. Garcia-Romero and D. Defreitas. 1988. NOAA Gulf of Mexico Status and Trends Program: Trace Organic Contaminant Distribution in Sediments and Oysters. *Estuaries* 11:171-179.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Oregon Department of Environmental Quality (ODEQ)

AREA OF STUDY: Willamette River and tributaries

SAMPLING MEDIA: Surface sediment

ASSOCIATED TISSUE DATA: Yes

POSITIONING SYSTEM: N/A

REFERENCE SOURCE: ODEQ 1994

CONTACT: Neil Mullane, ODEQ, Portland, OR

PHONE: (503) 229-5284

FAX: (503) 229-6124

SAMPLING PERIOD: 1988-1991

NUMBER OF STATIONS SAMPLED: Approximately 26 locations

LOCATIONS OF STATIONS SAMPLED: Willamette River (RMs 6, 7, 8, 14, 16, 18, 27, 38, 47, 48, 52, 74, 131, 145, 147 and 161). Tributary samples include: Columbia Slough, Johnson Creek, Clackamas River, Tualatin River, Fanno Creek, Beaverton Creek, Yamhill River, South Yamhill River, Conser Slough, Amazon Creek Drainage, McKenzie River, and the Middle Fork of the Willamette River.

TARGET ANALYTES: Dioxins and furans; pesticides; PCBs; PAHs; Co-planar PCBs; metals.

ANALYTICAL TECHNIQUES: Dioxins and furans (EPA Method 1613A); PAHs (EPA Method 8270); Metals (EPA 600/4-82-020); PCBs and pesticides (EPA Method 8080). All data entered in the database were reported on a wet weight basis. Limited data for dioxin and furan monitoring at wood treatment facilities was reported on a dry weight basis in other sources. Total dioxin and furan concentrations were determined by the laboratory as the sum of the individual congeners that were detected.

SAMPLING EQUIPMENT USED: Stainless steel Eckman dredge

SAMPLE HANDLING AND PROCESSING: There were three to five grabs taken per sampling location. Grabs were placed in a stainless steel bucket, homogenized, placed in a sample jar and put on ice for shipping to the laboratory.

DATA GAPS: Latitude and longitude of sampling locations. Latitude and longitude were estimated for entry in the database. Exact sampling dates were also unavailable for some analytical results. Data are reported on a wet weight basis. No percent solids or moisture data were provided

which would allow conversion of the data to a dry weight reporting basis; units that are more consistent with data reported from other sediment contaminant studies.

ABSTRACT

A study investigating the presence and effects of toxic pollutants in the Willamette River and selected tributaries was conducted by the Oregon Department of Environmental Quality (ODEQ) in cooperation with the U.S. EPA and Oregon State University (OSU). The studies stated objectives were to determine if bioaccumulative toxic pollutants were present in sediment and fish tissue and to determine the possible effects of the pollutants present on the aquatic resources using bioassays and other aquatic life toxicity testing methods. This study was used as a screening survey to add to the existing toxic pollutant data base for the Willamette River. The sampling sites selected were sampled in previous toxic monitoring programs and were chosen to represent ambient levels, significant industrial and municipal sources, and typical urban non-point source impacts.

The report prepared by ODEQ (1994) is a compilation and summary of data collected as part of their Toxic Monitoring Program.

QA/QC EVALUATION - No QA/QC evaluation of the data was provided with the report. The data qualifiers provided with the data were defined as follows:

JEstimated value; value not accurate.

MPresence of material verified but not quantified.

UMaterial was analyzed for but not detected. Value is the detection limit.

DATA USE AND COMPARABILITY - Users of these data should be reminded that the data were reported on a wet weight basis. All other data in the existing database is reported on a dry weight basis. Caution should be exercised when comparing the ODEQ sediment contaminant data to other data sets. Users of these data should also be reminded that the data provided are in the form of summary tables for a number of sampling episodes that have occurred over the course of the program. Some inconsistencies were noted between the data summarized in the ODEQ (1994) report and other sources of this information (e.g. Curtis et al. 1993). For example, the dioxin and furan data for the Woodtreater Study are reported by ODEQ (1994) on a wet weight basis, but another report that includes these data (Tetra Tech 1992) provides the same results, but reported on a dry weight basis. The dioxin and furan data for the Woodtreater Study were entered as they were reported in Tetra Tech (1992).

REFERENCES:

Curtis, L.R., H.M. Carpenter, R.M. Donohoe, D.E. Williams, O.R. Hedstrom, M.L. Deinzer, M.A. Beilstein, E. Foster, and R. Gates. 1993. Sensitivity of cytochrome P450-1A1 induction in fish as a biomarker for distribution of TCDD and TCDF in the Willamette River, Oregon. *Environ. Sci. Technol.* 27:2149-2157.

Tetra Tech. 1992. Columbia River chlorinated dioxins/furans ambient water quality assessment report. Prepared for U.S. EPA, Region 10, Water Monitoring and Analysis Section. Tetra Tech, Inc., Bellevue, WA.

Oregon Department of Environmental Quality (ODEQ). 1994. Willamette River toxics study - 1988/1991. Department of Environmental Quality, Water Quality Division, Portland, OR.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: U.S. Geological Survey (National Water Quality Assessment Program)

AREA OF STUDY: Yakima River Basin

SAMPLING MEDIA: Bed-sediment (top 0.5 inch)

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: YES

REFERENCE SOURCE: Rinella et al. 1992

CONTACT: Frank Rinella, USGS, Portland, OR

PHONE: (503) 231-2292

FAX: N/A

SAMPLING PERIOD: August-November 1987, August-September 1988, 1989 (May, July, November),
October-November 1990.

NUMBER OF STATIONS SAMPLED: 58 stations

LOCATIONS OF STATIONS SAMPLED: Waptus River, Cle Elum River, Jungle Creek, North Fork
Teanaway River, Teanaway River, Taneum Creek, South Fork Manastash Creek, Naneum
Creek, Cherry Creek, Yakima River, Umatanum Creek, Little Naches River, American River,
Rattlesnake Creek, Moxee Drain, Wide Hollow Creek, South Fork Ahtanum, Granger Drain,
Toppenish Creek, Satus Creek, Sulphur Creek, and Spring Creek.

TARGET ANALYTES: Organochlorine pesticides, total PCBs, and semi-volatile organics. Conventional
analyses included particle size and inorganic and organic carbon.

ANALYTICAL TECHNIQUES: EPA Method 8080 (U.S. EPA 1986) for organochlorine compounds,
Wershaw et al. (1983,1987) modified for semi-volatile organics. Data are reported on a dry
weight basis. The method for determining total PCBs was not described in the report.

SAMPLING EQUIPMENT USED: Hand-held scoops and a Teflon-lined Ekman grab sampler.

SAMPLE HANDLING AND PROCESSING: Samples were wet sieved using stainless-steel sieves
(2-mm, 180- μ m, and 62- μ m openings) and the resulting size classes were chilled with ice. All sample
containers were oven-baked and lids consisted of either Teflon or oven-baked aluminum foil inserts.
Samples from 26 samples were individually processed and samples from 32 stations were composited into
seven samples.

DATA GAPS: none

ABSTRACT

Contaminant data assessed in a variety of media (water, suspended and bed sediment, soil, and aquatic biota) were presented for samples collected from the Yakima River Basin between 1987 and 1990. The assessment was conducted as part of the U.S. Geological Survey's National Water Quality Assessment Program which was designed to describe the status and trends in the Nation's ground and surface water resources. For this study; water, sediments, molluscs, aquatic plants, fish, and crayfish were analyzed for organochlorine pesticides, total PCBs, and semi-volatile organics.

QA/QC EVALUATION - All data were reviewed for accuracy and precision. The review included an evaluation of method blanks, matrix spikes and duplicates, and surrogate recoveries to assure acceptable method performance.

The laboratory data were reviewed and data qualifiers were added as appropriate. The data qualifiers used were defined as follows:

E Estimated value.

U Concentration is less than the value shown.

DATA USE AND COMPARABILITY - Data have undergone extensive review and validation. All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Rinella, J.F., S.W. McKenzie, J.K. Crawford, W.T. Foreman, P.M. Gates, G.J. Fuhrer, and M.L. Janet. 1992. Surface-water-quality assessment of the Yakima River Basin, Washington: Pesticide and other trace-organic-compound data for water, sediment, soil, and aquatic biota, 1987-91. U.S. Geological Survey, Portland, OR. Open-File Report 92-644.

U.S. Environmental Protection Agency. 1986. Test methods for evaluating solid waste (3rd ed.). U.S. Environmental Protection Agency, Office of Solid Waste and Emergency response, Washington, D.C.

Wershaw, R.L., M.J. Fishman, R.R. Grabbe, and L.E. Lowe (eds.). 1987. Methods for the determination of organic substances in water and fluvial sediments. U.S. Geological Survey Techniques of Water-Resources Investigations, Book 5, Chapter A3.

Wershaw, R.L., M.J. Fishman, R.R. Grabbe, and L.E. Lowe (eds.). 1983. Methods for the determination of organic substances in water and fluvial sediments. U.S. Geological Survey Open-File report 82-1004.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: U.S. Geological Survey (National Water Quality Assessment Program)

AREA OF STUDY: Yakima River Basin

SAMPLING MEDIA: Streambed sediment (top 1 to 2 cm)

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Ryder et al. 1992

CONTACT: Jeane Ryder, USGS, Denver, CO

PHONE: N/A

FAX: N/A

SAMPLING PERIOD: August-September, 1987

NUMBER OF STATIONS SAMPLED: 430 sites

LOCATIONS OF STATIONS SAMPLED: All samples were collected within the Yakima River Basin. Samples were collected randomly from 269 lower-order streambed sites, 75 samples were collected from higher-order streambed sites, and the remaining samples represent storm water urban drains, soils, and analysis of variance sampling.

TARGET ANALYTES: Forty-four metals, TOC, and sediment grain size.

ANALYTICAL TECHNIQUES: Thirty-seven metals were analyzed by Inductively Coupled Plasma-Atomic Emission Spectrometry and three metals were analyzed by Atomic Absorption Spectrometry. Mercury was analyzed by cold vapor-Atomic Absorption Spectrometry. The remaining metals were analyzed by titration and fluorimetry. Total carbon was determined by combustion and infrared spectrometry and inorganic carbon was determined by titration. Organic carbon was calculated from the difference between total and inorganic carbon. Analytical methods are described in detail by Arbogast (1990). All results are reported on dry weight basis.

SAMPLING EQUIPMENT USED: Stainless steel Ekman and ponar dredges, hand-held or pole mounted plastic scoops, stainless steel scoops.

SAMPLE HANDLING AND PROCESSING: Five to seven subsamples were collected from lower-order streams. The subsamples were sieved through a 2-mm stainless steel screen and transferred to a Hubco aerobic sample bag. The samples were air dried before shipped to the laboratory. The laboratory sieved the samples through a 63 micron sieve and the < 63 micron

portion was analyzed. Three to five subsamples from higher-order streams were composited in a plastic tub, then wet sieved through a 63 micron stainless steel sieve. The sieved sediment/water slurry was placed in a 2 liter glass jar and allowed to stand overnight. After settling, the water was siphoned off and the settled fines placed in polypropylene containers and air dried.

DATA GAPS: None

ABSTRACT

The overall scope of the surface water NAWQA program includes organic and inorganic analyses of media such as water, sediments, and biota. Inorganic data from this report will be used to relate the occurrence and distribution of major and trace elements to geologic sources and land use activities. In addition, the elements associated with streambed sediments are important contributors to water column chemistry and will aid in modeling source-fate investigations. Forty-four metals were analyzed in addition to the determination of total, inorganic, and organic carbon for samples collected from 430 sites (Ryder et al. 1992).

QA/QC EVALUATION - Quality assurance was evaluated by including standard reference materials, random split samples, and laboratory duplicates. Quality assessment procedures and results for analytical precision and accuracy for the four NAWQA pilot studies are presented by Sanzolone and Ryder (1989).

The laboratory data were reviewed and data qualifiers were added as appropriate. The data qualifiers used were defined as follows:

BInsufficient sample for analysis.

HInterference.

UConcentration is less than value shown.

DATA USE AND COMPARABILITY - Users of these data should be reminded that the results are for specific grain size fractions which can not be compared directly to results from bulk sediment analyses.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Arbogast, B.F. 1990. Quality assurance manual for the Branch of Geochemistry. U.S. Geological Survey. U.S. Geological Survey Open-File Report 90-668.

Ryder, J.L., R.F. Sanzolone, G.J. Fuhrer, and E.L. Mosier. 1992. Surface-water-quality assessment of the Yakima River basin in Washington: Chemical analyses of major, minor, and trace elements in fine-grained sediment. U.S. Department of the Interior, U.S. Geological Survey. Open-File Report 92-520.

Sanzolone, R.F., and J.L. Ryder. 1989. Quality assessment program and results for the NAWQA surface water pilot studies. U.S. Geological Survey Open-File Report 89-658.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: U.S. Fish and Wildlife Service (USFWS)

AREA OF STUDY: Columbia River - Grays Bay to Umatilla

SAMPLING MEDIA: Sediment

ASSOCIATED TISSUE DATA: Yes

POSITIONING SYSTEM: N/A

REFERENCE SOURCE: Schuler 1994

CONTACT: Carol Schuler, USFWS, Portland, OR

PHONE: (503) 231-6179

FAX: N/A

SAMPLING PERIOD: May-September 1991

NUMBER OF STATIONS SAMPLED: 8 Stations.

LOCATIONS OF STATIONS SAMPLED: Baker Bay, Camas, Cathlamet Bay, Lewis and Clark, Longview, Julia Butler, Ridgefield and Umatilla.

TARGET ANALYTES: Dioxins and furans; PCBs; organochlorine pesticides; Hg.

ANALYTICAL TECHNIQUES: Dioxins/furans (EPA Method 1613). All results are reported on a dry weight basis. Total dioxin and furan concentrations were determined by the laboratory as the sum of the individual congeners that were detected. The method for determination of total PCBs was not described.

SAMPLING EQUIPMENT USED: N/A

SAMPLE HANDLING AND PROCESSING: N/A

DATA GAPS: Latitude and longitude of sampling locations. Type of analytical techniques used for chemical analysis. Sampling protocols and QA/QC procedures were not described.

ABSTRACT

The Columbia River Estuary is exposed to a variety of contaminants through municipal and industrial permitted discharges, urban and industrial nonpoint pollution, accidental spills of oil and hazardous materials, agricultural runoff, and accelerated population growth (Schuler 1992). This study intended to provide information needed to determine if hazardous concentrations of organic pollutants are accumulating in fish and wildlife from the Columbia River and its National Wildlife Refuges. Sediment, aquatic invertebrates, fish, and bird egg samples were collected for this study. Preliminary study results were reported in Schuler (1992).

The data were provided as raw laboratory data sheets and hardcopies of summary spreadsheets. The data were entered from the summary spreadsheets that were provided by Carol Schuler of the U.S. Fish and Wildlife Service (Schuler 1994).

QA/QC EVALUATION - No QA/QC evaluation was provided with the data. The data qualifiers used were defined as follows:

BNo information provided.

JNo information provided.

PRNo information provided.

UNot detected. Value is the detection limit.

DATA USE AND COMPARABILITY - All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Schuler, C. 1992. Organochlorine contaminants in aquatic resources from the Columbia River. Progress report. Fiscal year 1992. U.S. Department of the Interior, Fish and Wildlife Service, Portland Field Office, Portland, OR.

Schuler, C. 8 September 1994. Personal Communication (data sent to Ms. Kimberly Stark, Tetra Tech, Redmond, WA). U.S. Fish and Wildlife Service, Portland, OR.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: U.S. Army Corps of Engineers

AREA OF STUDY: Lower Columbia River, Willamette River

SAMPLING MEDIA: Surface and sub-surface sediment (top 2 cm to several feet)

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Stockton 1991

CONTACT: James Britton, ACOE, Portland, OR

PHONE: (503) 326-6471

FAX: N/A

SAMPLING PERIOD: 1980 through 1990

NUMBER OF STATIONS SAMPLED: 170

LOCATIONS OF STATIONS SAMPLED: Astoria, Baker Bay, Cathlamet Bay, Chinook, Columbia River, Ilwaco, Skipanon, Tongue Point, Elochoman Slough, Oregon Slough, St. Helens, Willamette River, Wind River.

TARGET ANALYTES: Grain size, total organic carbon, ten metals, pesticides, total PCBs, total PAHs, oil and grease, and ammonia. All results are reported on a dry weight basis.

ANALYTICAL TECHNIQUES: The report is a printed copy of the Army Corps of Engineers' Columbia River sediment database as of May 1991. Information regarding analytical techniques was not available. No information was provided on the method used to determine the total concentrations of DDT, DDE, DDT, PAHs, or PCBs.

SAMPLING EQUIPMENT USED: Information on equipment type was not available.

SAMPLE HANDLING AND PROCESSING: Sample handling and processing information was not available.

DATA GAPS: Latitude and longitude of sampling locations, analytical methods, sampling gear, sample handling and processing were not available. However, information for specific sampling projects is available from the Portland District Corps of Engineers. Latitude and longitude were estimated for entry in the database.

ABSTRACT

The report is a compilation of contaminant data entered in the U.S. Army Corps of Engineers, Portland District's Columbia River sediment database as of May 1991 (Stockton 1991). The database is separated into two sections containing estuarine and riverine data. The riverine database includes data from the Willamette River up to the Broadway Bridge area in Portland, as well as sampling stations as far upstream as Wind River. The estuarine database includes sampling stations in the lower reaches of the Columbia River. Sampling sites contained in the database are from Federal dredging projects. Data are provided for grain size, total organic carbon, metals, pesticides, total PCBs, and total PAHs. Samples include surface sediments and sediments collected by coring, which may include sub-surface sediments.

QA/QC EVALUATION - Information relevant to quality assurance/quality control was not available. However, the U.S. Army Corps of Engineers has a QA/QC program for review and evaluation of contaminant data. Information regarding the quality of specific data may be obtained by contacting the Portland District Corps of Engineers.

The only qualifier code used in the data set provided was "U" - Not detected. Value given is the detection limit.

DATA USE AND COMPARABILITY - Users of these data should be cautioned that not all of the database entries are for surface sediments. Some analyses were conducted on sediments collected with coring devices. Therefore, some samples include sub-surface sediments collected from a few to several feet below the sediment surface.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Stockton, S.L. 24 May 1991. Personal Communication (transmittal of riverine database output to Mr. Bruce Bennet, Tetra Tech, Inc., Bellevue, WA). Chief, Planning and Engineering Division, U.S. Army Corps of Engineers, Portland, OR.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: U.S. Army Corps of Engineers (USACOE)

AREA OF STUDY: Lower Columbia River

SAMPLING MEDIA: Surface sediment

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Siipola 1994

CONTACT: Mark Siipola, USACOE, Portland, OR.

PHONE: (503) 326-6463

FAX: N/A

SAMPLING PERIOD: May 1990, September 1991

NUMBER OF STATIONS SAMPLED: 16 stations

LOCATIONS OF STATIONS SAMPLED: Columbia River between RM 149-181 (Cascade Locks to Mayer State Park); lower Columbia River (Camas, St. Helens, Longview and Wauna).

TARGET ANALYTES: Dioxins and furans; PAHs; PCBs; metals.

ANALYTICAL TECHNIQUES: Dioxins and furans (EPA Method 8290). All results are reported on a dry weight basis. Total dioxin and furan concentrations were determined by the laboratory as the sum of the individual congeners that were detected.

SAMPLING EQUIPMENT USED: Benthos gravity corer

SAMPLE HANDLING AND PROCESSING: N/A

DATA GAPS: Latitude and longitude of sampling locations. Latitude and longitude were estimated for entry along with the data provided in the database.

ABSTRACT

These data represent the USACOE, Portland District's sediment quality data with regard to dioxins and furans in sediment samples from areas that have already been dredged and areas that may potentially be dredged (Siipola 1994). Sample locations include areas where there is potential dioxin and furan sediment contamination and/or where previous sampling has indicated the presence of similar hydrophobic organic compounds (PCBs, PAHs, pesticides) or dioxin/furans. PAHs, PCBs, pesticides and metal analysis results are reported in Stockton (1992).

QA/QC EVALUATION - Laboratory method blanks and internal standards were prepared and processed along with each extraction batch as part of the QA/QC procedure.

The only qualifier code used in the data set provided was "U" - Not detected. Value given is the detection limit.

DATA USE AND COMPARABILITY - Users of these data should be reminded that targeted sample areas consisted of areas where dioxins and furans were expected to be present.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Siipola, M.D. 17 August 1994. Personal Communication (data package containing sediment dioxin data submitted to Mr. Curtis DeGasperi, Tetra Tech, Inc., Redmond, WA). U.S. Army Corps of Engineers, Portland District, Portland, OR. Data for 1989 U.S. Government Moorings study - Willamette River. Analyses of Columbia River/Willamette River sediment samples - 1990 reconnaissance study. Various locations in Bonneville Pool - 1991. Mouth of Columbia River - 1992.

Stockton, S.L. 29 January 1992. Personal Communication (transmittal of Columbia River and Willamette River sediment dioxin/furan data). Chief, Planning and Engineering Division, U.S. Army Corps of Engineers, Portland, OR.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Oregon Department of Environmental Quality (ODEQ)

AREA OF STUDY: Lower Columbia River-St. Helens

SAMPLING MEDIA: Surface sediment (top 2 cm)

ASSOCIATED TISSUE DATA: Yes

POSITIONING SYSTEM: Trimble Navigation GPS

REFERENCE SOURCE: Tetra Tech 1992a

CONTACT: Steve Ellis, Tetra Tech, Inc., Redmond, WA

PHONE: (206) 883-1912

FAX: (206) 881-6997

SAMPLING PERIOD: September 1991

NUMBER OF STATIONS SAMPLED: 5 sites

LOCATIONS OF STATIONS SAMPLED: Multnomah Channel, Fishtrap Shoal, St. Helens Marina, Warrior Rock, and Columbia City

TARGET ANALYTES: Seventeen dioxin and furan congeners. Conventional analyses included particle size, total solids, and total organic carbon (TOC).

ANALYTICAL TECHNIQUES: Dioxins and furans (EPA Method 1613A), TOC (modified EPA Method 415.1), total solids (EPA Method 160.3.), particle size (Puget Sound Estuary Program Protocols). All results are reported on a dry weight basis.

SAMPLING EQUIPMENT USED: 0.06 m² van Veen grab sampler.

SAMPLE HANDLING AND PROCESSING: Each sediment sample consisted of a composite of at least four grab samples. Surface sediments (top 2 cm) were transferred to a stainless steel bowl and homogenized with a stainless steel spatula. The samples were placed in jars and stored on ice except for the samples designated for TOC analysis. These samples were stored on dry ice.

DATA GAPS: none

ABSTRACT

Monitoring of sediment and crayfish (*Pacifastacus leniusculus*) was conducted in order to satisfy monitoring requirements set forth in the City of St. Helens National Discharge Elimination System (NPDES) Permit (Tetra Tech 1992). Samples were collected from five sites to evaluate the accumulation of dioxins and furans in sediment and crayfish. Sediment and crayfish sampling primarily focused on locations downriver from the location of the outfall pipe.

Sediment samples were collected and analyzed for seventeen dioxin/furan congeners, particle size distribution, total solids, and total organic carbon. All sediment data are presented on dry weight basis and TOC-normalized values are also provided in the report. Sampling station latitude and longitude were recorded from geographic coordinates provided by a Trimble Navigation Global Positioning System receiver.

QA/QC EVALUATION - Data were reviewed by Dr. William Luksemburg of Alta Analytical Laboratory. The review included all ion chromatograms, initial and continuing calibrations, column performance check mixes, calculations of positive values and detection limits, ion abundance ratios for internal/surrogate/recovery standards and positive natives, matrix spikes and duplicates, and calculation of lipid content. No data were qualified based upon review of QA/QC data. Method blank, laboratory control sample, internal standard, and detection limit data were included in the report.

The only qualifier code used in the data set provided was "U" - Not detected. Value given is the detection limit.

DATA USE AND COMPARABILITY - Comparisons between sediment and crayfish tissue contaminant data collected for this study are possible as the sampling locations for crayfish correspond to sediment sampling sites.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Tetra Tech. 1992. City of St. Helens discharge monitoring report: Accumulation of dioxins and furans in sediment and biota. Prepared for City of St. Helens, St. Helens, OR. Tetra Tech, Inc., Bellevue, WA.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Oregon Department of Environmental Quality (ODEQ)

AREA OF STUDY: Lower Columbia River-Wauna

SAMPLING MEDIA: Surface sediment (top 2 cm)

ASSOCIATED TISSUE DATA: Yes

POSITIONING SYSTEM: Trimble Navigation GPS

REFERENCE SOURCE: Tetra Tech 1992c

CONTACT: Steve Ellis, Tetra Tech, Inc., Redmond, WA

PHONE: (206) 883-1912

FAX: (206) 881-6997

SAMPLING PERIOD: September 1991

NUMBER OF STATIONS SAMPLED: 5 sites

LOCATIONS OF STATIONS SAMPLED: Wallace Island, Westport Slough, Downriver from mill, Bradwood, Clifton Channel

TARGET ANALYTES: Seventeen dioxin and furan congeners. Conventional analyses included particle size, total solids, and total organic carbon (TOC).

ANALYTICAL TECHNIQUES: Dioxins and furans (EPA Method 1613A), TOC (modified EPA Method 415.1), total solids (EPA Method 160.3.), particle size (Puget Sound Estuary Program Protocols). All results are reported on a dry weight basis.

SAMPLING EQUIPMENT USED: 0.06 m² van Veen grab sampler.

SAMPLE HANDLING AND PROCESSING: Each sediment sample consisted of a composite of at least four grab samples. Surface sediments (top 2 cm) were transferred to a stainless steel bowl and homogenized with a stainless steel spatula. The samples were placed in jars and stored on ice except for the samples designated for TOC analysis. These samples were stored on dry ice.

DATA GAPS: none

ABSTRACT

Monitoring of sediment and crayfish (*Pacifastacus leniusculus*) was conducted in order to satisfy monitoring requirements set forth in the James River Wauna Mill's National Discharge Elimination System (NPDES) Permit (Tetra Tech 1992). Samples were collected from five sites to evaluate the accumulation of dioxins and furans in sediment and crayfish. Sediment and crayfish sampling primarily focused on locations downriver from the location of the outfall pipe.

Sediment samples were collected and analyzed for seventeen dioxin/furan congeners, particle size distribution, total solids, and total organic carbon. Data are presented on a dry weight basis and TOC-normalized values are also provided in the report. Sampling station latitude and longitude were recorded from geographic coordinates provided by a Trimble Navigation Global Positioning System receiver.

QA/QC EVALUATION - Data were reviewed by Dr. William Luksemburg of Alta Analytical Laboratory. The review included all ion chromatograms, initial and continuing calibrations, column performance check mixes, calculations of positive values and detection limits, ion abundance ratios for internal/surrogate/recovery standards and positive natives, matrix spikes and duplicates, and calculation of lipid content. No data were qualified based upon review of QA/QC data. Method blank, laboratory control sample, internal standard, and detection limit data were included in the report.

The only qualifier code used in the data set provided was "U" - Not detected. Value given is the detection limit.

DATA USE AND COMPARABILITY - Comparisons between sediment and crayfish tissue contaminant data collected for this study are possible as the sampling locations for crayfish correspond to sediment sampling sites.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Tetra Tech. 1992. James River Wauna Mill discharge monitoring report: Accumulation of dioxins and furans in sediment and biota. Prepared for James River Corporation, Wauna, OR. Tetra Tech, Inc., Bellevue, WA.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Lower Columbia River Bi-State Program (Bi-State)

AREA OF STUDY: Lower Columbia River - Bonneville Dam to river mouth

SAMPLING MEDIA: Surface sediment (top 2 cm)

POSITIONING SYSTEM: Magnavox MX 2000 GPS Navigator System

ASSOCIATED TISSUE DATA: Yes

REFERENCE SOURCE: Tetra Tech 1993

CONTACT: Steve Ellis, Tetra Tech, Inc., Redmond, WA

PHONE: (206) 883-1912

FAX: (206) 881-6997

SAMPLING PERIOD: September-October 1991

NUMBER OF STATIONS SAMPLED: 54 stations

LOCATIONS OF STATIONS SAMPLED: Mainstem and backwater areas of the lower Columbia River—River Mile 0 to 147, the mouth of the Columbia River to Bonneville Dam.

TARGET ANALYTES: Seventeen dioxin and furan congeners, 7 PCB Aroclors, 16 metals and trace elements (Al, Sb, As, Ba, Be, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Ag, Tl, Zn), cyanide, 52 semi-volatile organic compounds (SVOCs) including 11 phenolic compounds and 15 polynuclear aromatic hydrocarbons, 28 pesticides, 7 PCB Aroclors, 3 butyltin compounds including tributyltin, and 7 long-lived radionuclides. Conventional analyses included sediment grain size and total organic carbon content. All data are reported on a dry weight basis.

ANALYTICAL TECHNIQUES: Dioxins and furans (EPA Method 1613 with modifications); PCB Aroclors (EPA Method 8080); metals and trace elements [Ag, Al, Ba, Cu, Cr, Fe, Ni, Sb, Tl, and Zn by ICP (EPA Method 200.7); As (EPA 7060), Be (EPA 7091), Cd (EPA 7131), Pb (EPA 7421), and Se (EPA 7740) by GFAA; Hg (EPA 7471) by CVAA]; cyanide [colorimetry (EPA 9010)]; SVOCs (EPA 8270); pesticides and PCBs (EPA 8080), Butyltins (GC/MS with SIM); radionuclides by alpha spectroscopy and gamma counting.

SAMPLING EQUIPMENT USED: 0.1 m² stainless steel van Veen grab, Magnavox MX 2000 Global Positioning System (GPS)

SAMPLE HANDLING AND PROCESSING: Sediment samples consisted of a homogenized composite of at least 3 grab samples. Samples were shipped on ice to laboratory. Sample chain-of-custody procedures were followed.

DATA GAPS: none

ABSTRACT

Tetra Tech, Inc., was contracted by the Lower Columbia River Bi-State Program to conduct a reconnaissance level survey of water, sediment, and biota (fish and crayfish) contaminant levels in these media of the lower Columbia River below Bonneville Dam (Tetra Tech 1993). Sediment and fish tissue sampling (including crayfish) focused on locations in the mainstem and backwater areas of the lower river.

Sediment sampling was conducted using a stainless steel 0.1 m² van Veen grab deployed by winch from a vessel. Station latitude and longitude were recorded from geographic coordinates provided by a Magnavox MX 2000 Global Positioning System (GPS) Navigator System receiver onboard the vessel. The GPS locational information was not corrected for the U.S. Department of Defense's Selective Availability, and therefore the GPS latitudes and longitudes provided are accurate to approximately ± 100 m.

QA/QC EVALUATION - The sediment data submitted by the laboratories were reviewed and validated by Tetra Tech using guidance provided in the Quality Assurance/Quality Control (QA/QC) Plan developed for this project and guidance provided by U.S. EPA (1988a,b). A data validation report was prepared as part of the final report and is bound separately as Volume 2: Appendix A, Data Validation Reports. The QA/QC procedures included sampling and analysis of field and laboratory replicates and matrix spike/matrix spike duplicate (MS/MSD) analyses on a minimum of 5 percent of the samples that were collected. Some data were qualified based on review of laboratory replicate and MS/MSD results, and additional instrument calibration and performance data provided by the laboratories.

The laboratory data were reviewed and data qualifiers were added as appropriate. The data qualifiers used were defined as follows:

For dioxin and furan results "" indicates the analyte was quantified using a DB-225 column. For pesticide/PCB results "*" indicates that reporting limits were adjusted due to coeluting peaks. For semivolatile compounds "*" indicates that the results presented are from re-extraction and re-analysis of the sample.

E Estimated value.

J Estimated value is less than the specified detection limit.

E/J For butyltin data the estimated value is less than the specified detection limit.

E/M For butyltin data low spectral match pairs may affect the estimated value.

M Estimated maximum possible concentration.

R Data unusable.

U Not detected. Value is the detection limit.

DATA USE AND COMPARABILITY - Although comparison between sediment and fish tissue contaminant data collected in this program is possible, the sampling area for fish at a particular station was generally greater than the area designated as the sediment sampling station. Furthermore, with the exception of crayfish, it is not known to what extent the fish species collected reside in the vicinity of the sampling station. The original data may be found in Volume 3: Data Tables. Appendices B, C, D, & E. of Tetra Tech (1993).

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Tetra Tech. 1993. Reconnaissance Survey of the lower Columbia River. Task 6: Reconnaissance report. Volumes 1, 2, and 3. Prepared for Columbia River Bi-State Program. Tetra Tech, Inc., Redmond, WA.

U.S. Environmental Protection Agency. 1988a. Laboratory data validation functional guidelines for evaluating inorganics analyses. U.S. EPA/Hazardous Site Evaluation Division, Washington, D.C.

U.S. Environmental Protection Agency. 1988b. Laboratory data validation functional guidelines for evaluating organics analyses. U.S. EPA/Hazardous Site Evaluation Division, Washington, D.C.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Lower Columbia River Bi-State Program (Bi-State)

AREA OF STUDY: Lower Columbia River - Bonneville Dam to river mouth

SAMPLING MEDIA: Surface sediment (top 2 cm)

POSITIONING SYSTEM: Magnavox MX 2000 GPS Navigator System

ASSOCIATED TISSUE DATA: Yes

REFERENCE SOURCE: Tetra Tech 1994

CONTACT: Steve Ellis, Tetra Tech, Inc., Redmond, WA

PHONE: (206) 883-1912

FAX: (206) 881-6997

SAMPLING PERIOD: June-July 1993

NUMBER OF STATIONS SAMPLED: 15 stations

LOCATIONS OF STATIONS SAMPLED: Backwater areas of the lower Columbia River—River Mile 14 to 141, Youngs Bay to Skamania Landing.

TARGET ANALYTES: Seventeen dioxin and furan congeners, 7 PCB Aroclors, 16 metals and trace elements (Al, Sb, As, Ba, Be, Cd, Cr, Cu, Fe, Pb, Hg, Ni, Se, Ag, Tl, Zn), cyanide, 59 semi-volatile organic compounds (SVOCs) including 11 phenolic compounds and 17 polynuclear aromatic hydrocarbons, 26 pesticides, 6 PCB Aroclors, 3 butyltin compounds including tributyltin, and 8 long-lived radionuclides. Conventional analyses included sediment grain size and total organic carbon content. All data are reported on a dry weight basis.

ANALYTICAL TECHNIQUES: Dioxins and furans (EPA Method 1613 with modifications); PCB Aroclors (EPA Method 8080); metals and trace elements [Ag, Al, Ba, Be, Cu, Cr, Fe, Ni, Tl, and Zn by ICP (EPA Method 200.7); Sb (EPA 204.2), As (EPA 206.2), Cd (EPA 213.2), Pb (EPA 239.2), and Se (EPA 270.2) by GFAA; Hg (EPA 245.2) by CVAA]; cyanide (SM 4500-CN E); SVOCs (EPA 8270) with SIM for PAH analysis; pesticides and PCBs (EPA 8080); butyltins (GC/MS with SIM); radionuclides by alpha spectroscopy and gamma counting.

SAMPLING EQUIPMENT USED: 0.02 m² stainless-steel Petite-Ponar grab sampler, Magnavox MX 2000 Global Positioning System (GPS)

SAMPLE HANDLING AND PROCESSING: Sediment samples consisted of a homogenized composite of the top 2 cm of sediment from at least 3 grab samples. Three composite samples were collected from each station. Samples were shipped on ice to laboratory. Sample chain-of-custody procedures were followed.

DATA GAPS: none

ABSTRACT

Tetra Tech, Inc., was contracted by the Lower Columbia River Bi-State Program to conduct a supplemental reconnaissance survey of sediment and biota (fish and crayfish) contaminant levels in backwater areas of the lower Columbia River (Tetra Tech 1994). These samples were intended to expand the data base of the original reconnaissance survey reported in Tetra Tech (1993). Station latitude and longitude were recorded from geographic coordinates provided by a Magnavox MX 2000 Global Positioning System (GPS) Navigator System receiver. The GPS locational information was not corrected for the U.S. Department of Defense's Selective Availability, and therefore the GPS latitudes and longitudes provided are accurate to approximately ± 100 m.

QA/QC EVALUATION - The sediment data submitted by the laboratories were reviewed and validated by Tetra Tech using guidance provided in the Quality Assurance/Quality Control (QA/QC) Plan developed for this project and guidance provided by U.S. EPA (1988a,b). A data validation report was prepared as part of the final report and is bound separately as Volume 2: Appendix A, Data Validation Reports. The QA/QC procedures included sampling and analysis of field and laboratory replicates and matrix spike/matrix spike duplicate (MS/MSD) analyses on a minimum of 5 percent of the samples that were collected. Some data were qualified based on review of laboratory replicate and MS/MSD results, and instrument calibration and performance data provided by the laboratories.

The laboratory data were reviewed and data qualifiers were added as appropriate. The data qualifiers used were defined as follows:

BContamination present in the blank sample.

EEstimated value.

JValue is below the nominal detection limit.

PConcentration difference between the two columns is greater than 25 percent.

UNot detected. Value is the detection limit.

DATA USE AND COMPARABILITY - The field replicated data allow for statistical comparisons. Although comparison between sediment and fish tissue contaminant data collected in this program is possible, the sampling area for fish at a particular station was generally greater than the area designated as the sediment sampling station. Furthermore, with the exception of crayfish, it is not known to what extent the fish species collected reside in the vicinity of the sampling station. The original data may be found in Volume 3: Data Tables - Appendices B, C, D, & E of Tetra Tech (1994).

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Tetra Tech. 1993. Reconnaissance Survey of the lower Columbia River. Task 6: Reconnaissance report. Volumes 1, 2, and 3. Prepared for Columbia River Bi-State Program. Tetra Tech, Inc., Redmond, WA.

Tetra Tech. 1994. Draft report. Lower Columbia River Backwater Reconnaissance Survey. Volumes 1, 2, and 3. Prepared for Lower Columbia River Bi-State Committee. Tetra Tech, Inc., Redmond, WA.

U.S. Environmental Protection Agency. 1988a. Laboratory data validation functional guidelines for evaluating inorganics analyses. U.S. EPA/Hazardous Site Evaluation Division, Washington, D.C.

U.S. Environmental Protection Agency. 1988b. Laboratory data validation functional guidelines for evaluating organics analyses. U.S. EPA/Hazardous Site Evaluation Division, Washington, D.C.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: U.S. Army Corps of Engineers (USACOE)

AREA OF STUDY: Lower Columbia River - Old mouth of Cowlitz River

SAMPLING MEDIA: Surface and sub-surface sediment

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: U.S. Army Corps of Engineers 1991

CONTACT: Mark Siipola, USACOE, Portland, OR

PHONE: (503) 326-6463

FAX: N/A

SAMPLING PERIOD: January 1991

NUMBER OF STATIONS SAMPLED: 5 stations

LOCATIONS OF STATIONS SAMPLED: Old mouth of the Cowlitz River

TARGET ANALYTES: Nine metals, polynuclear aromatic hydrocarbons, phenols, organochlorine pesticides, PCBs, grain size, and volatile solids. All data are reported on a dry weight basis.

ANALYTICAL TECHNIQUES: Samples were analyzed following EPA methodology for all chemical analyses. U.S. Army Corps of Engineers methodology was followed for physical parameters. All results are reported on a dry weight basis.

SAMPLING EQUIPMENT USED: Vibra-core sampler

SAMPLE HANDLING AND PROCESSING: Subsamples of sample cores were transferred to glass jars lined with teflon lids. Samples were cold stored in an ice chest.

DATA GAPS: Latitude and longitude of sampling locations were not provided. Latitude and longitude were estimated for entry along with the data provided in the database.

ABSTRACT

The old mouth of the Cowlitz River provides a channel from deep water in the Columbia River to old

river mile 0.7 of the Cowlitz River. The site has been dredged in the past to maintain the channel. The objective of the study was to evaluate the sediments for chemical contaminants and physical parameters which would prohibit unconfined in-water disposal. Analytical testing for metals, polynuclear aromatic hydrocarbons, phenols, pesticides, and PCBs were conducted on four sediment samples collected in January 1991. Six samples were analyzed for grain size and volatile solids.

QA/QC EVALUATION - Laboratory quality control consisted of method blanks, duplicate analyses, matrix spikes, and surrogate spike recoveries. All QC data were within acceptable limits with the exception of matrix spike recoveries for three pesticides. The recoveries were outside of the upper control limits; however, as these compounds were not detected in the samples, it was determined that the data were not adversely impacted by the high recoveries.

The only qualifier code used in the data set provided was "U" - Not detected. Value given is the detection limit.

DATA USE AND COMPARABILITY - Data presented for this report were from the laboratory data sheets. Results were compared to CENPP Tiered Testing Guidelines and requirements of Section 404 of the Clean Water Act for acceptability for in-water disposal.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

U.S. Army Corps of Engineers. 1991. Old mouth of the Cowlitz River sediment evaluation. Unpublished data. U.S. Army Corps of Engineers, Portland District, Troutdale, OR.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: James River Corporation

AREA OF STUDY: Lower Columbia River - Camas

SAMPLING MEDIA: Surface sediment

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Young 1988

CONTACT: Carol Whittaker, James River Mill, Camas, WA

PHONE: (206) 834-8390

FAX: N/A

SAMPLING PERIOD: September 1988

NUMBER OF STATIONS SAMPLED: 3 stations

LOCATIONS OF STATIONS SAMPLED: Parker's Landing (RM 121), Camas ASB Outfall, 300 ft. downstream (RM 120), and Hassalo Rock (RM 117).

TARGET ANALYTES: Metals (Sb, As, Ba, Be, B, Cd, Ca, Cr, Cu, Pb, Mn, Hg, Ni, Se, Ag, Tl, Sn, Zn); organics (PCBs, pesticides, semi-volatiles). All data are reported on a dry weight basis.

ANALYTICAL TECHNIQUES: No information regarding analytical techniques was provided in the report. No information was provided on the method used to determine total PCB concentration.

SAMPLING EQUIPMENT USED: Stainless steel bucket and diver

SAMPLE HANDLING AND PROCESSING: Procedures followed those in the 16th Ed. of Standards Methods and corresponding EPA publication.

DATA GAPS: Latitude and longitude were not provided. Latitude and longitude were estimated for entry along with the data provided in the database.

ABSTRACT

The Puget Sound Water Quality Authority (PSWQA) is responsible for developing, adopting and

overseeing the implementation of a water quality management plan for Puget Sound. The Department of Ecology, which adopts some of PSWQA's ideas, began investigative work in 1987 to monitor Columbia River dischargers to ensure they are consistent with the PSWQA demands for marine waters. The particular focus of this investigation was to confirm the impact of the Camas Mill's wastewater discharge on Columbia River sediments (Young 1988).

QA/QC EVALUATION - No QA/QC information was provided in the report. The only qualifier code used in the data set provided was "U" - Not detected. Value given is the detection limit.

DATA USE AND COMPARABILITY - Users of these data should be reminded that they were collected in the vicinity of a potential source of industrial pollutants.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Standard Methods for the Examination of Water and Wastewater, 16th Ed., American Public Health Association, Washington, D.C., 1985.

Young, S.R. 1988. Columbia River sediment. Report to D.F. Bachman, Environmental Department, James River-Camas Mill, October 18, 1988.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: James River Corporation

AREA OF STUDY: Lower Columbia River - Camas

SAMPLING MEDIA: Surface sediment

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Young 1989

CONTACT: Carol Whittaker, James River Mill, Camas, WA

PHONE: (206) 834-8390

FAX: N/A

SAMPLING PERIOD: September 1989

NUMBER OF STATIONS SAMPLED: 3 stations

LOCATIONS OF STATIONS SAMPLED: Parker's Landing (RM 121), Camas ASB Outfall, 300 ft. downstream (RM 120), and Hassalo Rock (RM 117).

TARGET ANALYTES: Metals (Sb, As, Ba, Be, B, Cd, Ca, Cr, Cu, Pb, Mn, Hg, Ni, Se, Ag, Tl, Sn and Zn), organics (PCB, pesticides, volatiles) and TOC. All data are reported on a dry weight basis.

ANALYTICAL TECHNIQUES: No information was provided on the analytical techniques used.

SAMPLING EQUIPMENT USED: Stainless steel pitcher fastened to the end of a rigid probe.

SAMPLE HANDLING AND PROCESSING: Procedures followed those in the 16th Ed. of Standards Methods and corresponding EPA publication.

DATA GAPS: Latitude and longitude were not provided. Latitude and longitude were estimated for entry along with the data provided in the database.

ABSTRACT

The Puget Sound Water Quality Authority (PSWQA) is responsible for developing, adopting and

overseeing the implementation of a water quality management plan for Puget Sound. The Department of Ecology, which adopts some of PSWQA's ideas, began investigative work in 1987 to monitor Columbia River dischargers to ensure they are consistent with the PSWQA demands for marine waters. The particular focus of this investigation was to confirm the impact of the Camas Mill's wastewater discharge on Columbia River sediments (Young 1989). This study is a follow up on the Young (1988) study which initially sampled the outfall area in 1988.

QA/QC EVALUATION - No QA/QC information was provided in the report. The only qualifier code used in the data set provided was "U" - Not detected. Value given is the detection limit.

DATA USE AND COMPARABILITY - Users of these data should be reminded that they were collected in the vicinity of a potential source of industrial pollutants.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Standard Methods for the Examination of Water and Wastewater, 16th Ed., American Public Health Association, Washington, D.C., 1985.

Young, S.R. 1988. Columbia River sediment. Report to D.F. Bachman, Environmental Department, James River-Camas Mill, October 18, 1988.

Young, S.R. 1989. Columbia River sediment. Report to D.F. Bachman, Environmental Department, James River-Camas Mill, November 28, 1989.

COLUMBIA RIVER BASIN BIOTA AND SEDIMENT DATABASE
SEDIMENT DATA ABSTRACT

AGENCY SPONSOR: Washington State Department of Ecology (WDOE)

AREA OF STUDY: Lower Columbia River - Vancouver

SAMPLING MEDIA: Surface sediment (top 2 cm)

POSITIONING SYSTEM: N/A

ASSOCIATED TISSUE DATA: No

REFERENCE SOURCE: Zinner 1990

CONTACT: Lisa Zinner

PHONE: (206) 407-6000

FAX: N/A

SAMPLING PERIOD: January 1990

NUMBER OF STATIONS SAMPLED: 1 station

LOCATIONS OF STATIONS SAMPLED: The sampling location was 60 - 70 feet downstream from ALCOA-Vancouver's outfall diffuser.

TARGET ANALYTES: VOAs, BNAs, metals, pesticides/PCBs and general chemistry.

ANALYTICAL TECHNIQUES: VOA (EPA 8260), BNA (EPA 8270), metals (EPA 200) and pesticides/PCBs (EPA 8080). All results are reported on a dry weight basis.

SAMPLING EQUIPMENT USED: 0.1 m² van Veen grab sampler

SAMPLE HANDLING AND PROCESSING: Sample consisted of a composite of six grab samples. The samples were mixed thoroughly and then divided for separate analysis. Samples collected for volatile organics analysis were taken directly from the grab sampler. Samples were kept on ice and shipped to the laboratory.

DATA GAPS: none

ABSTRACT

The objectives of the Aluminum Company of America (Alcoa) Class II Inspection was to verify effluent

compliance with NPDES permit (NPDES Permit No. WA-000029-9), determine effluent toxicity using a suite of bioassays, identify possible chemical pollutants in selected inplant wastewaters, settling lagoon influent and lagoon effluent samples with a priority pollutant scan, assess the impact of the industrial discharge on the receiving water sediments with chemical analysis for priority pollutants and toxicity testing using a *Hyallela* bioassay, review Alcoa laboratory procedures to determine conformance to standard techniques and advance state-of-the-art compliance inspections by contributing to ongoing developmental efforts with centrifugation (Zinner 1990). Samples of water and sediments were taken at each effluent and influent location and upstream and downstream from the facility.

QA/QC EVALUATION - No QA/QC information was provided in the report. The data qualifiers used were defined as follows:

JEstimated value when the result is less than the specified detection limit.

NARNo analytical result.

REJCompound was not quantified.

UNot detected. Value is the detection limit.

DATA USE AND COMPARABILITY - Users of these data should be reminded that they were collected in the vicinity of a potential source of industrial pollution.

All data entered in the database were reviewed for data entry errors. All detected errors were corrected.

REFERENCES:

Zinner, L. 1990. Aluminum Company of America (ALCOA) Class II Inspection, January 1990. Washington State Department of Ecology, Environmental Investigations and Laboratory Services Program, Olympia, WA.